Technical Paper 94

DEPARTMENT OF THE INTERIOR

JAN 21 1915

U.S. BUREAU OF MINES

JOSEPH A. HOLMES, DIRECTOR

METAL-MINE ACCIDENTS

IN THE

UNITED STATES

DURING THE CALENDAR YEAR 1913

COMPILED BY

ALBERT H. FAY

WASHINGTON
GOVERNMENT PRINTING OFFICE
1914

The Bureau of Mines, in carrying out one of the provisions of its organic act—to disseminate information concerning investigations made—prints a limited free edition of each of its publications.

When this edition is exhausted copies may be obtained at cost price only through the Superintendent of Documents, Government Printing Office, Washington, D. C., who is the authorized agent of the Federal Government for the sale of all publications.

The Superintendent of Documents *is not an official of the Bureau of Mines*. His is an entirely separate office, and he should be addressed:

SUPERINTENDENT OF DOCUMENTS,
Government Printing Office,
Washington, D. C.

The general law under which publications are distributed prohibits the giving of more than one copy of a publication to one person. Additional copies must be purchased from the Superintendent of Documents. The price of this publication is 10 cents.

First edition. October, 1914.

CONTENTS.

Page.
- Introduction 3
- Decrease of fatality rate in 1913 3
- Scope of statistics 5
- Acknowledgments 9
- Publication of accident statistics 6
- Copper mines 7
- Gold and miscellaneous metal mines 7
- Iron mines 8
- Lead and zinc mines 8
- Miscellaneous mineral mines 9
- Accident statistics by States 9
- Causes and distribution of accidents 9
- Fatalities at placer mines 10
- Metal-mine, coal-mine, and quarry accidents compared 13
- Metal-mine accidents in foreign countries 14
- Determination of number of men employed 15
- Fatality rates compared on basis of year of 300 working days 17
- Accidents classified by systems and methods of mining 18
- Serious and slight injuries 18
- Laws relating to reporting of accidents 20
    - Alaska 20
    - Arizona 21
    - California 21
    - Colorado 21
    - Idaho 22
    - Illinois 22
    - Maryland 22
    - Michigan 22
    - Minnesota 23
    - Missouri 23
    - Montana 23
    - Nevada 24
    - New Jersey 24
    - New York 24
    - Oregon 25
    - Pennsylvania 25
    - South Dakota 25
    - Washington 25
    - Wisconsin 26
- Classification of injuries in 1915 statistics 26
- Tabulated statistics 26
- Publications on mine accidents and methods of mining 71

TABLES.

TABLE 1. Number of men employed and number of men killed and injured in and about all metal and miscellaneous mineral mines (except coal mines) in the United States during the calendar years 1913 and 1912 27

2. Number of men killed and injured in and about all metal and miscellaneous mineral mines (except coal mines) in the United States during the calendar year 1913, by causes 28

3. Number of men killed in and about all metal and miscellaneous mineral mines (except coal mines) in the different States during the calendar year 1913, by causes 32

Original from PRINCETON UNIVERSITY

Page.

TABLE 4. Number of men killed in and about the various groups of mines in the United States during the calendar year 1913, by causes...... 36

5. Number of men employed, number of days worked, and number of men killed per 1,000 employed in and about all metal and miscellaneous mineral mines (except coal mines) in the different States during the calendar year 1913.................................. 44

6. Number of men employed, number of days worked, and number of men killed per 1,000 employed in and about the copper mines in the United States during the calendar year 1913................ 45

7. Number of men employed, number of days worked, and number of men killed per 1,000 employed in and about the gold and miscellaneous metal mines in the United States during the calendar year 1913.. 46

8. Number of men employed, number of days worked, and number of men killed per 1,000 employed in and about the iron mines in the United States during the calendar year 1913.................... 47

9. Number of men employed, number of days worked, and number of men killed per 1,000 employed in and about the lead and zinc mines (Mississippi Valley) in the United States during the calendar year 1913... 48

10. Number of men employed, number of days worked, and number of men killed per 1,000 employed in and about the miscellaneous mineral mines in the United States during the calendar year 1913. 48

11. Number of men seriously injured in and about all metal and miscellaneous mineral mines (except coal mines) in the United States (by States) during the calendar year 1913, by causes............ 50

12. Number of men slightly injured in and about all metal and miscellaneous mineral mines (except coal mines) in the United States (by States) during the calendar year 1913, by causes................ 54

13. Number of men seriously and slightly injured per 1,000 employed in and about all metal and miscellaneous mineral mines (except coal mines) in the United States (by States) during the calendar year 1913.. 58

14. Number of mine operators reporting less than 1,000 days' work performed and number of those reporting 1,000 or more days' work performed during the calendar year 1913...................... 60

15. Percentages of deaths in and about all metal and miscellaneous mineral mines (except coal mines) in the United States resulting from various causes during the calendar years 1913, 1912, and 1911.... 61

16. Percentages of injuries in and about all metal and miscellaneous mineral mines (except coal mines) in the United States resulting from various causes during the calendar years 1913, 1912, and 1911.... 62

17. Number of men killed or injured per 1,000 employed in and about all metal and miscellaneous mineral mines (except coal mines) in the United States, based on the actual average number of days worked, compared with similar data based on a year of 300 working days... 64

18. Number of men employed, number of days worked, and number of men killed per 1,000 employed in and about all metal and miscellaneous mineral mines in the different States in the calendar year 1912.. 66

19. Number of men seriously and slightly injured per 1,000 employed in and about all metal and miscellaneous mineral mines (except coal mines) in the United States (by States) during the calendar year 1912.. 68

20. Comparison, by years, of the number of men employed in the metal mines of the principal countries, showing the fatality rate per 1,000 persons employed.................................. 70

METAL-MINE ACCIDENTS DURING THE CALENDAR YEAR 1913.

Compiled by ALBERT H. FAY.

INTRODUCTION.

The death rate in the metal mines of the United States in 1913 shows a gratifying decrease from the record of 1912, the total number killed, as reported by the various operators, being 683, as compared with 661 in 1912 and 695 in the preceding year. The number of men employed during 1913 was 193,088, as compared with 169,199 in 1912. The fatality rate was therefore 3.54 per 1,000 men employed, as against 3.91 per 1,000 for 1912 and 4.19 for 1911.

Fatality figures for 1911, 1912, and 1913 for all mines and quarries in the United States follow:

Number of men employed and number killed in and about all mines and quarries in the United States during 1911, 1912, and 1913.

Kind of mines.	Number employed.	Number killed.	
		Total.	Number per 1,000 employed.
Metal mines	193,088	683	3.54
Coal mines	747,644	2,785	3.73
Quarries	106,278	183	1.72
Total for 1913	1,047,010	3,651	3.49
Total for 1912	1,004,966	3,234	3.22
Total for 1911	1,005,281	3,602	3.58

DECREASE OF FATALITY RATE IN 1913.

Although the total number of persons killed in the metal mines during 1913 was slightly more than in 1912, yet there were about 24,000 more men employed, so that the fatality rate is reduced to 3.54 per 1,000 employed during 1913, as compared with 3.91 for 1912. A number of the States show a slight increase, but a majority of the principal mining States show marked decreases.

The important mining States showing a continuous reduction of fatality rates during 1911, 1912, and 1913 are Idaho, Michigan, Montana, Nevada, New Jersey, South Dakota, and Utah, which in 1913 represented 38 per cent of the mining industry. Of the States showing a decreased fatality rate during 1913 as compared with 1912 only, may be mentioned Alabama, Colorado, New York, Oklahoma, Tennessee, Wisconsin, and Wyoming.

This gradual reduction is to be accounted for largely by the introduction of safety appliances, better supervision and a stricter enforcement of rules and regulations, and a closer observance of the State laws. Practically all of the larger companies, and many of the smaller ones, have done much in safeguarding their employees, and have helped to spread the "safety first" movement. By first-aid treatment many slight injuries were properly dressed, so that pain was relieved and a cure effected in a short time, with the added result that many minor injuries were kept from becoming serious or fatal.

Number of men killed in and about the ***metal*** *mines in the United States during 1911, 1912, and 1913.*

State.	Number killed.		
	1911	1912	1913
Alabama	10	33	22
Alaska	(a)	b 21	25
Arizona	70	67	86
Arkansas	2	1	0
California	38	40	52
Colorado	43	48	44
Florida	9	6	14
Georgia	2	0	1
Idaho	23	29	24
Illinois	1	1	1
Indiana, Louisiana, Rhode Island, and West Virginia	1	0	0
Iowa	1	0	0
Kansas	2	2	4
Kentucky	3	1	0
Michigan	134	96	82
Minnesota	76	50	63
Missouri	38	36	34
Montana	62	50	64
Nevada	50	34	25
New Hampshire	0	1	0
New Jersey	23	13	8
New Mexico	11	13	28
New York	10	17	14
North Carolina	4	1	4
Ohio	0	1	0
Oklahoma	0	2	1
Oregon	2	1	3
Pennsylvania	1	2	0
South Dakota	8	6	8
Tennessee	10	12	10
Texas	0	0	1
Utah	49	41	36
Vermont	0	2	1
Virginia	6	4	12
Washington	3	4	4
Wisconsin	3	22	11
Wyoming	0	4	1
Total	695	661	683

[a] No report.
[b] Placer mines not included.

SCOPE OF STATISTICS.

The following tables giving the accidents in the metal mines in the United States for the calendar year 1913 have been compiled by the Bureau of Mines from reports received directly from the operators, except in the case of Alaska, Colorado, and New York. In the compilation of these figures the size of the mines was not considered, and the figures cover reports from prospectors, development companies, and producing mines.

Although the Bureau of Mines is authorized to collect data relating to accidents at mines, there is no Federal law compelling operators to render such reports. However, the majority of the operators promptly and cheerfully replied to the bureau's requests for information. The tabulated statistics represent 6,387 operators who actually worked their mines during the year, this number comparing with 5,967 who reported for 1912 and 5,232 for 1911. As far as can be ascertained, all of the large companies made out detailed reports, so that, measured on the basis of production, the statistics represent the industry. The small number of operators who did not reply represent less than 10 per cent of the names on the mailing list, and on the basis of ore produced represent a much smaller percentage of the industry.

Many of the answers received indicate that one reason why some operators did not reply was that their mines or prospects were small, and that as no accidents occurred a reply was not deemed necessary. It is hoped that all operators, whether large or small, will consider their property worthy of a report for the year 1914, whether an accident occurs or not. The true accident ratio can be obtained only when complete reports are rendered that give the number of men employed, as well as the number of days worked.

The tables in the following pages are arranged so as to represent five divisions of the mining industry, as follows:

Copper mines.—All of the copper mines and prospects that were reported in operation in the various copper-producing States are included in this group. The list represents 694 operators.

Gold and miscellaneous metal mines.—Under this heading are the gold mines, both lode and placer, silver mines, lead-silver mines, gold-silver mines, the lead and zinc mines other than those in the Mississippi Valley, and mines working ores of quicksilver, manganese, tungsten, vanadium, chromium, etc. Pyrite mines are included in this class, as the cinder is used in some of the metallurgical works for its iron and copper content. Bauxite mines, because bauxite is the principal source of metallic aluminum, are classed under this division. This group represents 4,749 operators, who reported their mines as active part or all of the year.

Iron mines.—All of the important iron mines, representing 206 operators, are given in the tables showing statistics relating to iron mining.

Lead and zinc mines (Mississippi Valley).—The lead and zinc mines, represented by reports of 409 operators of that region, are grouped together as representing an industry in which general conditions are similar.

Miscellaneous mineral mines.—The miscellaneous mineral mines, representing 329 operators, include those for asbestos, asphaltum, barite, feldspar, garnet, graphite, gypsum, kaolin, mica, phosphate rock, quartz, talc, salt, and soapstone. Coal mines are not included in this classification.

ACKNOWLEDGMENTS.

The acknowledgements of the bureau are due to the State mine inspectors and other officials of the various State mining departments, who have rendered invaluable assistance in verifying and correcting from their records, often at the expense of considerable time and trouble, the data reported to the bureau by the operators. Special mention should be made of the assistance rendered by the mine inspectors of Alaska, Colorado, Idaho, Missouri, Nevada, New York, and South Dakota, the Industrial Insurance Commission of Washington, and the Industrial Accident Commission of California. To both the operators and the State mining officials the Bureau of Mines extends its thanks for their hearty cooperation. The author acknowledges the assistance rendered by W. W. Adams in the compilation of the data herein contained.

PUBLICATION OF ACCIDENT STATISTICS.

In publishing the statistics presented in this report, the Federal Bureau of Mines has no intent of encroaching on the field covered by the annual or biennial reports of State mine inspectors or mining departments. The bureau hopes, however, that the distribution of the data contained herein will help to establish a uniform basis for recording and reporting mine accidents, the number of men employed, and the number of days' work performed. When all mine-accident statistics are thus placed on the same basis, the making of comparisons and the drawing of conclusions will be rendered much easier.

The plan that is proposed as most likely to the procuring of satisfactory statistics is that of cooperation between the Bureau of Mines and the inspectors or other appropriate representatives of the States. This cooperation will insure such uniformity in method and results as will make the data for each State comparable with the data of any other State, and the data for the mining industries of the United

Digitized by Google Original from PRINCETON UNIVERSITY

States comparable with those of the mining industries in other countries. Also, this plan has the merits of avoiding duplication of labor and expense and of insuring satisfactory results at minimum cost to both the Federal Government and the several States.

As bearing on the difficulties that attend the compilation of comparable figures, attention is called to the fact that a number of States have no inspectors for metal mines and there is a lack of uniformity in the reports issued by the various States that have inspectors. The fiscal years of the States are not uniform, some ending in June, others in September or October, and still others conforming to the calendar year.

In those States having an inspection service the fatality figures given herein were submitted to the various inspectors for verification, and from nearly all the bureau has received hearty cooperation. Only a few of the States collect statistics covering serious injuries and still fewer give any attention to slight injuries, so that on these points it is impossible to check closely. Although the total number of deaths reported in the various States agrees closely with the inspectors' reports, there is some variation as to the classification.

The Bureau of Mines will be glad to receive suggestions from State inspectors, and from any person interested in mining, as to the form in which the statistical data can be presented most effectively and as to the method of making their publication most useful to the mining industry.

COPPER MINES.

The figures given in Tables 2, 4, and 6 are compiled from reports of 694 operators of copper mines employing 56,139 men, of whom 39,917 were employed underground and 16,222 on the surface. Of the 694 replies, 395 were from prospects and small mines in which less than 1,000 days' labor was performed. The other 299 were from operators of mines where 1,000 or more days' labor was performed.

The total number of deaths and injuries due to accidents, and the rates per 1,000 employed, as reported (Table 1) are as follows: Deaths, 236, or 4.20 per 1,000 men employed; serious injuries, 2,195, or 39.10 per 1,000; slight injuries, 11,168, or 198.93 per 1,000. Of the total number of fatalities, 203 occurred underground, making the rate per 1,000 men employed 5.09. The number of surface fatalities was 33, or 2.03 per 1,000.

GOLD AND MISCELLANEOUS METAL MINES.

The accidents in and about the gold and miscellaneous metal mines are compiled in Tables 2, 4, and 7 from the reports of 4,749 operators, employing 61,313 men, of whom 46,143 were underground and 15,170 surface men. The number of deaths and injuries due to accidents and the rates per 1,000 employed (Table 1) are as follows: Deaths, 210, or 3.43 per 1,000 men employed; serious injuries, 632, or 10.31 per 1,000; slight injuries, 3,223, or 52.57 per 1,000. Of the total number of fatalities, 180 occurred underground, or 3.90 per 1,000, and 30 on the surface, or 1.98 per 1,000.

The rates of serious and slight injuries are low when compared with the corresponding rates at iron and copper mines. The difference may be explained in part by the fact that in this group are many prospects and small mines that keep no records, and that many of the mines are in States where there is no inspection and the operators are not required to keep accident records. At such mines minor accidents are forgotten, but fatal accidents which impress themselves on the memory are reported. The majority of the larger companies operating gold, silver, and lead-silver mines of the West have, for their own protection, hospital service and medical aid for their employees and are keeping excellent records.

IRON MINES.

The figures given in Tables, 2, 4, and 8 are compiled from the reports of 206 iron-mine operators, who employed 51,133 men, of whom 29,384 were employed underground and 21,749 on the surface, including those engaged in steam-shovel work. The number of deaths and injuries resulting from accidents in these mines (Table 1) is as follows: Deaths, 165, or 3.23 per 1,000 men employed; serious injuries, 2,820, or 55.15 per 1,000; and slight injuries, 10,653, or 208.34 per 1,000. Of the total number of fatalities, 122 occurred underground, or 4.15 per 1,000 employed, and 43 employees were killed while engaged in surface work, making this rate 1.98 per 1,000.

LEAD AND ZINC MINES.

The lead and zinc mines for which data are compiled include mines in the Mississippi Valley only. The lead and zinc mines of other States are grouped with miscellaneous metal mines on account of the difficulty of making a distinct classification, as in many places, for instance, in the lead-silver mines in the Coeur d'Alene district of Idaho, lead and zinc occur as associated metals in silver ores. The Mississippi Valley lead and zinc mines form a class by themselves and are easily segregated.

The figures given in Tables 2, 4, and 9 are compiled from the reports of 409 operators, employing 12,697 men, of whom 9,261 were employed underground and 3,436 on the surface. Of the 409 operators reporting, 93 operated small mines and prospects at each of which less than 1,000 days' labor was performed.

The total number of deaths and injuries due to accidents as reported (Table 1) is as follows: Deaths, 42, or 3.31 per 1,000 men employed;

serious injuries, 91, or 7.17 per 1,000; and slight injuries, 1,345, or 105.93 per 1,000. Of the total number of fatalities, 32 occurred underground, making the rate 3.46 per 1,000 men employed below the surface. The surface fatalities were 10, or 2.91 per 1,000 employed.

MISCELLANEOUS MINERAL MINES.

The reports of 329 operators of miscellaneous mineral mines are compiled in Tables 2, 4, and 10. These mines employed 11,806 men, of whom 2,997 were employed underground and 8,809 on the surface. The total number of deaths and injuries due to accidents reported (Table 1) is as follows: Deaths, 30, or 2.54 per 1,000 men employed; serious injuries, 152, or 12.87 per 1,000; and slight injuries, 692, or 58.61 per 1,000. When compared with the rates for the copper and iron mines these ratios seem exceedingly low. Judging from the reports received, this difference is largely explainable by the mines being small and not keeping complete records. The majority of these mines are in States where there are neither State inspection nor compensation laws, and operators are not obliged to keep accident records or make reports of accidents. Furthermore, about 75 per cent of the men are employed on the surface, the danger being thus reduced to the basis of quarry operations. The figures for 1913 show a higher injury ratio than previous years, indicating that more complete records are being kept.

ACCIDENT STATISTICS BY STATES.

A compilation of the accident statistics, by States, is given in Tables 3, 5, 11, 12, and 13, representing 6,387 operators employing 193,088 men, of whom 127,702 were employed underground and 65,386 on the surface. The total number of fatalities and serious and slight injuries due to accidents is as follows: Deaths, 683, or 3.54 per 1,000 men employed; serious injuries, 5,890, or 30.50 per 1,000; and slight injuries, 27,081, or 140.55 per 1,000. Of the total number of fatalities, 548 occurred underground, or at the rate of 4.29 per 1,000, and 135 were killed on the surface, or 2.06 per 1,000 employed.

The great irregularity of the ratio between serious and slight injuries in different States is apparent. The reason for this difference is discussed under the heading "Serious and Slight Injuries," where extracts from the laws relating thereto are given.

CAUSES AND DISTRIBUTION OF ACCIDENTS.

In Table 15 is given the percentage of deaths and injuries due to any one cause in each group of mines and for all of the mines combined. It will be noted, for instance, that 38.10 per cent of the

Digitized by Google Original from PRINCETON UNIVERSITY

deaths in lead and zinc mines, 16.48 per cent of the serious injuries, and 14.20 per cent of the slight injuries were due to falls of rock or ore from roof or wall. A similar comparison may be made for any group of mines for any one of the 41 causes enumerated. This table also shows that approximately two-thirds of the total deaths and injuries that occurred in and about metal mines were caused as follows:

Of the fatalities, 36.16 per cent were due to falls of ore or rock from roof, wall, or bank; 13.04 per cent to explosives; 12.31 per cent to falling down stope, shaft, winze, or bank; and 11.42 per cent to haulage systems.

Of the serious injuries, 24.12 per cent were due to falls of roof, wall, or bank; 17.22 per cent to car and haulage systems; 9.43 per cent to machinery; and 12.69 per cent to timber and hand tools.

Of the slight injuries, 22.65 per cent were due to falls of roof, wall, or bank; 13.27 per cent to car and haulage systems; 8.83 per cent to machinery; and 15.78 per cent to timber and hand tools.

Fatalities due to falls of roof or wall are slightly more than in previous years. No fatalities were reported as due to mine fires in 1913, whereas in 1911 there were 37 such fatalities. Those due to falling down shaft were 26, as compared with 40 in 1912 and 57 in 1911. No reduction has been made in the fatalities due to explosives.

FATALITIES AT PLACER MINES.

The accompanying tables contain the combined reports of 745 operators of placer mines, including dredges, hydraulic mines, and underground gravel mines. It will be noted from the tables that 6,680 men were employed at these mines, and that 15 men were killed, representing a fatality rate of 2.25 per 1,000 men employed as compared with 2.43 for 1912. The average length of time these mines were operated was 199 days. The placer mines of Alaska operated approximately 180 days, and all other placers 220 days. The average length of time all metal mines (except placers) were operated was 288 days. Although the fatality rate for placer mines is somewhat lower than that for the other metal mines, yet the length of time the employees were exposed to the mining risk was less. If the number of employees be reduced to the 300-day basis, it becomes equivalent to 4,430 men, with a fatality rate of 3.36, as compared with 3.73 for all other mines, not including placer or coal mines. The figures for 1912 did not include Alaska placers. For the first time these are included in the bureau's report. The serious and slight injuries occurring at Alaska placer mines were not included in the Territorial mine inspector's report, hence these details are lacking in this report.

Accidents in ***placer*** *mines of the United States during the calendar years 1912 and 1913.*

Cause of accident.	1912			1913		
	Number killed.	Number seriously injured.	Number slightly injured.	Number killed.[a]	Number seriously injured.	Number slightly injured.
Dredging.						
Machinery	2	11	6	3	14	21
Electricity	0	0	0	2	0	1
Boiler explosions or bursting steam pipes	0	0	1	0	0	0
Falls of persons	0	1	7	0	5	13
Tools	0	5	22	0	6	19
Other causes	2	3	15	2	22	33
Total number killed or injured by dredging accidents	4	20	51	7	47	87
Hydraulicking.						
Cave of bank	2	0	3	0	1	4
Explosives	1	0	0	0	0	1
Hydraulic giants	1	1	1	0	0	0
Falls of persons	0	1	4	0	2	1
Rock while handling	0	0	7	0	3	4
Tools	0	0	4	0	0	1
Machinery, derricks, etc	0	1	0	1	2	0
Other causes	0	0	4	0	0	1
Total number killed or injured by hydraulicking accidents	4	3	23	1	8	12
Underground.						
Fall of roof or gravel	0	0	5	5	5	4
Timber or hand tools	0	0	3	1	0	3
Explosives	0	0	1	0	0	0
Falls of persons	0	0	0	1	1	0
Haulage	0	0	1	0	0	0
Drilling	0	0	1	0	0	1
Hoisting	0	0	1	0	1	0
Steam (when steam points are used)	0	0	0	0	0	0
Other causes	0	0	0	0	2	0
Total number killed or injured by underground accidents	0	0	12	7	9	8
Grand total	8	23	86	15	64	107

[a] Includes fatalities in Alaska placers. The fatalities for 1912 and the serious and slight injuries for 1912 and 1913 are not included in this report.

Number of men employed, number killed, and days worked in **placer** *mines of the United States during the calendar year 1913.*

State.	Number of active operators.	Number of employees.	Days' work performed.	Average number of days worked.	Number of men killed.																										Grand total.
					Dredging.							Hydraulicking.									Underground.										
					By machinery.	By electricity.	By boiler explosions or bursting steam pipes.	By falls of persons.	By tools.	By other causes.	Total.	By cave of bank.	By explosives.	By hydraulic giants.	By falls of persons.	By rock while handling.	By tools.	By machinery, derricks, etc.	By other causes.	Total.	By fall of roof or gravel.	By timber or hand tools.	By explosives.	By falls of persons.	By haulage.	By drilling.	By hoisting.	By steam (when steam points are used).	By other causes.	Total.	
					1	2	3	4	5	6		7	8	9	10	11	12	13	14		15	16	17	18	19	20	21	22	23		
Alaska[a]	250	3,500	630,000	180	1					2	3										5			1						6	9
Arizona	4	75	6,848	91																											
California	230	1,742	433,756	249	2	2					4							1		1		1								1	6
Idaho	92	568	116,424	205																											
Montana	51	302	57,820	191																											
Nevada	15	102	23,592	231																											
New Mexico	7	65	16,464	253																											
Oregon	70	225	33,778	150																											
South Dakota	5	19	2,770	146																											
Utah	4	25	694	28																											
Washington	6	16	2,522	158																											
Wyoming	11	41	4,365	106																											
Total, 1913	**745**	**6,680**	**1,329,033**	**199**	**3**	**2**				**2**	**7**							**1**		**1**	**5**	**1**		**1**						**7**	**15**
Total, 1912[b]	459	3,289	849,091	258	**2**					**2**	**4**	**2**	**1**	**1**						**4**											**8**

[a] Reported by Sumner S. Smith, United States mine inspector, Juneau, Alaska.

[b] Does not include Alaska.

METAL-MINE, COAL-MINE, AND QUARRY ACCIDENTS COMPARED.

Comparative data for metal mines, coal mines, and quarries of the United States during 1912 and 1913 are shown in the tables that follow. The majority of the coal-mining States have systematic coal-mine inspection, which tends to reduce the accidents; whereas many of the metal-mining States have no inspection service.

On account of the great disasters that occur in coal mines and the prominence given to them by the newspapers, coal mining is usually considered much more hazardous than metal mining, but the figures in the tables below show that in 1911 the fatality rate in metal mines was about 10 per cent higher and in 1912 was 20 per cent higher than in the coal mines. In 1913 the rate was about 5 per cent less for metal mines than for coal mines.

As the figures show, metal mines usually do not claim their death toll in disasters that involve many men, most of the men who die from accidents being killed one at a time. Altogether, there were reported in the metal mines in 1913, 31 accidents in which 2 or more men were killed at one time, making the total thus killed 79, or 11.6 per cent of all the fatalities as compared with 12.3 per cent in 1912 and 19.5 in 1911.

Although the fatality rate in metal mines during 1913 was 3.54 per 1,000 men employed, and in coal mines 3.73, yet the comparison is not absolutely fair, for the reason that the metal miners worked 285 days as compared with 238 days for the coal miners. Thus the men in the metal mines were exposed to the mining risk 47 days longer than were the coal miners. If both be reduced to the 300-day basis, the metal-mine fatality rate becomes 3.72 per 1,000 300-day workers in comparison with 4.70 for the coal mines and 2.10 for quarries.

Number of men employed and number of men killed in and about all mines and quarries in the United States during 1911, 1912, and 1913.[a]

Year.	Metal mines.			Coal mines.		
	Number employed.	Number killed.		Number employed.	Number killed.	
		Total.	Per 1,000 employed.		Total.	Per 1,000 employed.
1911	165,979	695	4.19	728,348	2,719	3.73
1912	169,199	661	3.91	722,662	2,360	3.27
1913	**193,088**	**683**	**3.54**	**747,644**	**2,785**	**3.73**
Average for 3 years	176,089	680	3.86	732,885	2,621	3.58

[a] This table continued on p. 14.

Number of men employed and number of men killed in and about all mines and quarries in the United States during 1911, 1911, and 1913—Continued.

Year.	Quarries.			Total, mines and quarries.		
	Number employed.	Number killed.		Number employed.	Number killed.	
		Total.	Per 1,000 employed.		Total.	Per 1,000 employed.
1911	110,954	188	1.69	1,005,281	3,602	3.58
1912	113,105	213	1.88	1,004,966	3,234	3.22
1913	**106,278**	**183**	**1.72**	**1,047,010**	**3,651**	**3.49**
Average for 3 years	110,112	195	1.77	1,019,086	3,496	**3.43**

Percentage of persons killed by different causes in and about ***metal mines, coal mines,*** *and* ***quarries*** *in the United States during 1911, 1912, and 1913.*

Kind of mine.	Cause of death.								
	Falls of overburden, roof, quarry material, ore, or coal.	Explosives.	Haulage and handling rock, ore, or coal.	Falls of person.	Electricity.	Machinery.	Gas and dust explosions.	Other causes.	Total.
1911:									
Metal mines.	**32.52**	**11.23**	**7.63**	**15.39**	**2.45**	**3.16**	....	**27.62**	**100.00**
Coal mines	48.58	4.93	17.54	1.54	3.46	1.77	13.94	8.21	100.00
Quarries	25.53	26.60	20.21	8.51	1.06	9.04	....	9.05	100.00
1912:									
Metal mines.	**34.82**	**14.21**	**9.99**	**13.91**	**3.78**	**3.78**	....	**19.51**	**100.00**
Coal mines	48.77	5.64	19.11	1.19	3.60	1.86	12.75	7.08	100.00
Quarries	23.94	22.07	22.07	8.91	1.88	10.80	....	10.33	100.00
1913:									
Metal mines.	**36.16**	**13.04**	**11.42**	**12.31**	**3.80**	**3.94**	....	**19.33**	**100.00**
Coal mines	45.39	4.96	18.63	1.80	3.16	1.79	18.46	5.81	100.00
Quarries	20.77	24.04	18.04	9.29	2.73	10.92	....	14.21	100.00

METAL-MINE ACCIDENTS IN FOREIGN COUNTRIES.

Table 20 has been compiled from official reports of representative foreign countries in which mining is an important industry. The table shows the number of men employed in and about metal mines, the number killed, and the rate of fatalities per 1,000 men employed. It will be noted that the fatality rates are lower than those of metal mines in the United States. One reason for the difference is that for many years rigid inspection has been enforced in most of the important foreign mining countries. In the older nations, as Great Britain, Germany, and France, the majority of the miners have worked about mines from childhood, as did their fathers and grandfathers before them. Another reason is that in these countries the majority of the miners speak a common language, and there is comparatively little misunderstanding of orders given by mine officials.

In the United States it is not uncommon to find at a large mine men representing 10 or even 20 nationalities, a very large percentage of whom can not speak English nor understand another language than their own. An Italian and a Swede may work side by side in a mine under a shift boss who gives his orders in English, a language not understood by either of the two men. In case an accident happens the survivor testifies through an interpreter before the coroner's jury that he thought the orders of the shift boss—not at all what they actually were—were "so and so." A common language is essential to safety in mining.

DETERMINATION OF NUMBER OF MEN EMPLOYED.

Although the bureau's request for information on which to base this report called for the average number of men employed during the year, it is possible that some of the companies, especially the smaller ones, may have reported the number of men on the pay roll rather than the average number at work full time. Unless exact records are kept, it is not easy to determine the average number of men actually at work during a year. The number of days a mine is operated and the number of deaths that occur are known and are reported. The number of men on the pay roll is also known, but the average number of men at work during the year must be calculated on the basis of the total number of shifts or days' labor (man-shifts per year) performed. With this figure as a basis the average number of men at work full time, and the average number of days worked per man per year may be obtained thus:

Let a=total actual man-shifts for which wages were paid during the year, as shown on pay-roll.
b=number of men on pay roll,
c=number of days mine was operated during the year,
x=average number of men at work (full time basis),
y=average number of shifts (days) worked per man per year;
then $x=\frac{a}{c}$=average number of men at work during the year, and
$y=\frac{a}{b}$=average number of shifts (days) worked per year per man.

As an illustration showing how the fatality rates are affected and different results may be obtained, two mines, A and B, may be cited. Mine A employed men as follows: Fifty men for 100 shifts; 50 men 150 shifts; 100 men 200 shifts; 500 men 250 shifts; and 1,000 men 310 shifts. The number of men on the pay roll was, therefore, 1,700, and the total work done was equivalent to the work of one man for 467,500 days. As the mine was in operation 310 days, the average number of men actually at work was 467,500÷310, or 1,508. If the number of men killed was 8, the rate per 1,000 employed on the pay-roll basis is 4.70; but based on the actual average number of men (1,508) the rate is 5.31 per 1,000. In other words, the latter rate (5.31) is 13 per cent higher than the rate on the pay-roll basis and is, no doubt, more nearly correct.

If the number of men killed in mine B was 8, the rate per 1,000 employed on the pay-roll basis is 4.70, as in mine A; but, based on the actual average number of men who worked, the rate is 4.91, as compared with 5.31 for mine A, thus indicating that mine B is safer than mine A, an indication that, as shown below, is misleading.

As mine B was operated only 250 days, whereas mine A was operated 310 days, the resulting 8 fatalities in each mine are not directly comparable, as the men in mine B were exposed to the mining risk 60 days less than the men in Mine A. A true comparison, however, can be made by reducing the number employed to a basis of 300-day workers, a number obtained by dividing the total number of days' labor performed at each mine by 300. The death rate per 1,000 300-day workers in mine A is 5.13, as compared with 5.89 in mine B.

A detailed comparison between the two hypothetical mines is given below:

Number of men employed and number of days worked at mines A and B.

MINE A (OPERATED 310 DAYS).

Number of men on pay roll.	Shifts worked per man.	Total days' labor performed.
50	100	5,000
50	150	7,500
100	200	20,000
500	250	125,000
1,000	310	310,000
1,700	275	467,500

MINE B (OPERATED 250 DAYS).

50	100	5,000
50	150	7,500
100	200	20,000
1,500	250	375,000
1,700	238	407,500

Comparative fatality rates at mines A and B.

Item.	Mine A.	Mine B.
Total men on pay roll	1,700	1,700
Average number at work	1,508	1,630
Number of 300-day workers	1,558	1,358
Total number of days of work	467,500	407,500
Average number of shifts or days worked per man	275	238
Total number killed	8	8
Total killed per 1,000 men (pay-roll basis)	4.70	4.70
Total killed per 1,000 men (average number at work)	5.31	4.91
Total killed per 1,000 men (basis of 300-day workers)	5.13	5.89

FATALITY RATES COMPARED ON BASIS OF YEAR OF 300 WORKING DAYS.

A comparison of the fatality rates in the various groups of mines, based on a year of 300 working days, is given in Table 17.

It is evident from the figures given in the table that a true comparison can not be made without reducing the number of days to a common denominator. In order to obtain the number of 300-day workers, it is necessary to know the total number of shifts (days) labor performed during the year, as discussed on a preceding page.

As during the year a mine can be operated only about 300 days, if Sundays, holidays, and a few days for repairs be excluded, a 300-day year has been used in this report, and a comparison of the accidents in the various States has been made upon this basis. Table 16 gives the average number of days actually worked at the mines in the various States during the year, this number ranging from 183 in Kentucky to 323 in Utah, the average for the United States being 285 days. The first column under "fatalities" gives the rate as obtained from the actual number of men reported as working, and the second column gives the rate when the number of employees is reduced to the equivalent of 300-day workers. For example, the number of days worked in Michigan was 280, which gives a fatality rate of 2.91 per 1,000 men employed. Minnesota shows 306 days worked, with a fatality rate of 3.22. This comparison is not fair, inasmuch as the men in Minnesota were subjected to the hazards of mining 26 days longer than in Michigan. By reducing the rate of each to the 300-day basis, the rate for Michigan becomes 3.12 and for Minnesota 3.16. Similar comparisons may be made for other States.

Japan and France report the total number of shifts labor performed during the year, from which it is possible to make comparisons on the 300-day basis. Until all countries have a common system of reporting, classifying, and publishing mine-accident statistics, no true comparisons can be made. It is hoped that all of the mining countries will eventually adopt a uniform year upon which to base their accident ratios.

Fatality rates in metal mines, coal mines, and quarries based on the actual average number of men employed and the equivalent of 300-day workers.

Basis of figures.	1912			1913		
	Number of men employed.	Number killed.	Number killed per 1,000 employed.	Number of men employed.	Number killed.	Number killed per 1,000 employed.
Metal mines:						
Average number employed	169,199	661	3.91	193,088	683	3.54
Number of 300-day workers	**161,662**	**661**	**4.09**	**183,593**	**683**	**3.72**
Coal mines:						
Average number employed	722,662	2,360	3.27	747,644	2,785	3.73
Number of 300-day workers	**541,997**	**2,360**	**4.35**	**593,131**	**2,785**	**4.70**
Quarries:						
Average number employed	113,105	213	1.88	106,278	183	1.72
Number of 300-day workers	**93,837**	**213**	**2.27**	**87,141**	**183**	**2.10**

ACCIDENTS CLASSIFIED BY SYSTEMS AND METHODS OF MINING.

Inasmuch as there are various systems and methods of mining, some methods must necessarily be more dangerous than others. In order to ascertain the comparative risk in different methods the bureau has revised its form for reporting mine accidents, and in 1914 the returns will be analyzed on the basis of the method or system of mining as shown by the outline given below.

METHODS OF MINING.

[Please check principal method used.]

A. Work in narrow veins.

1. Overhand stoping...........
2. Underhand stoping.........
3. "Gophering"...............
4. ....
5. ....
6. ....

B. Work in large ore bodies.

1. Overhand stoping (with timber).
2. Room and pillar (without timber)
3. Top slicing and caving..........
4. Glory-hole and mill-hole.......
5. Open pit, with steam shovel.....
6. Open pit, without steam shovel.
7. ....

Operators when reporting accidents for 1914 should not fail to indicate the principal mining method used, for it is possible that the classification of accidents on this basis will aid materially in bringing about the adoption of safer methods in many mines. It is understood, of course, that ore bodies can not be changed to suit mining systems, and that although safety should be the first consideration, other factors have to be considered in laying out a mine.

SERIOUS AND SLIGHT INJURIES.

The definition of an accident, a fundamental consideration, varies widely among mining companies and is far from being the same in the laws of the various States requiring reports. One operator or

State may require a detailed report of any casualty, however slight, that delays the worker, or that draws blood; another may not consider an accident worthy of record that does not come to the attention of the foreman or shift boss.

The list of reportable accidents has been increased so much within the last three or four years by the enactment of compensation laws, by closer inspection, and by the companies themselves that statistics seem to show a far greater number of casualties now than in the past. However, it is essential that every company have a record of any accident that may result in a serious injury for which compensation may be claimed, and also to prevent unjust claims arising, as then any case can be traced to its origin and the records will show full details. As many companies require a record of all injuries, it is not as easy as it formerly was to substantiate unjust claims. This minute and detailed classification is especially notable in the Lake Superior district.

The distinction made in this paper between a serious and a slight injury is entirely arbitrary. A line had to be drawn at some definite point, and hence a serious accident is considered in this report as one that would disable a man and keep him from duty 20 days or more. This class includes such injuries as broken arms and legs, loss of eye, and severe cuts and bruises.

A slight injury is considered as one that involves a loss of time of not less than 1 day nor more than 20 days. Under this class may be placed such injuries as cuts, sprains, mashed fingers, bruises, dirt in eye, slight burns, effect of powder smoke, etc. Of course any slight injury may become infected and thus result in a serious accident as defined above.

In some States there is no law whatever requiring a record of injuries or a report to any industrial or insurance board, commissioner of labor, or inspector, whereas in other States strict laws govern this feature. In those States where there are such laws the majority of the mining companies keep excellent records from which reports for the Bureau of Mines are compiled, and it is in these States that the injury ratio in many cases is very high. Unless all States report on the same basis, just comparisons can not be made.

In making comparisons of serious and slight injuries in the various States, it is necessary to take into account some of the features of the law governing the report of such injuries. One State may report fatal and serious injuries only, but without defining a "serious injury," and require no reports for slight injuries. One State may require reports of all fatalities and injuries incapacitating the employee for 1 week; others may specify the reporting of accidents causing disabilities ranging from 1 to 14 days. Thus one State may report, perhaps, only 25 per cent as many injuries as some other States in which the mining industry is of no greater magnitude. At first glance it would appear that mining is much safer in the former State than in any of the latter, but this, however, is a wrong conclusion. The major difference is largely a matter of recording and reporting the serious and slight injuries. The mining risk or hazard in one State as a whole does not vary much from that in any other, if the same tonnage of material is handled and an equal number of men employed.

The data in Tables 11, 12, and 13, in which the number of serious and slight injuries is given, have been arranged so that the data for the different States are grouped according to the State laws relating to inspection or industrial-accident compensation.

Class A includes the principal mining States in which there were in operation during a part or all of 1913 certain laws relating to the recording and reporting of mine-accident statistics. These States are as follows: Arizona, California, Colorado, Idaho, Michigan, Minnesota, Missouri, Montana, Nevada, New Jersey, New York, Oregon, South Dakota, Washington, and Wisconsin.

Class B includes the other mining States which during 1913 had no laws regarding compensation for injuries or requiring reports or records of serious and slight injuries. It also includes those States in which only a little mining is done and in which there are laws relating to industrial accidents.

Though the laws already in force are not uniform, they are a step in the right direction and, it is hoped, will eventually result in a uniform method of keeping mine-accident statistics.

LAWS RELATING TO REPORTING OF ACCIDENTS.

Some features of the laws relating to the reporting of accidents are given in the following pages, by States.

ALASKA.

By an act approved April 30, 1913, and effective April 1, 1914, the Legislature of Alaska authorized the appointment of a Territorial mine inspector subject to instructions from the Federal mine inspector. Sections 5 and 7 of the act provide that all serious or fatal accidents at any mine employing six or more persons shall be reported immediately by the person in charge of the mine to the mine inspector of the district in which the mine is located. Each mine inspector is required by section 6 to render to the governor a monthly report of all accidents in his district which have resulted in serious injury or death.

ARIZONA.

The law [a] of Arizona provides that all accidents causing death or serious injury at any mine shall be reported immediately to the State mine inspector. The inspector renders an annual report to the governor for the year ending November 30 (sec. 16).

By the act of June 8, 1912, as amended May 13, 1913, compulsory compensation is provided for accidental death or injuries causing disability for at least two weeks in all especially dangerous employments, including mining, quarrying, and tunneling. The law is elective as to industries not listed as especially dangerous.

CALIFORNIA.

The Legislature of California passed an act,[b] approved April 8, 1911, providing compensation for accidental injuries, and establishing an industrial-accident board to aid in the administration of the act. The act is elective for all employments except for State and local governments, for which it is compulsory. The employee also may elect not to be subject to the act by notifying his employer in writing.

On August 10, 1913, the industrial accident board was superseded by the industrial accident commission.[c]

Sections 36 to 50 (act of May 26, 1913) create an insurance fund to be administered by the industrial accident commission for the purpose of insuring the employer, at his option, against liability for compensation. The law became effective January 1, 1914.

COLORADO.

Section 4303 of the revised statutes of Colorado for 1908 provides that all accidents, causing death or serious injury involving the loss of two consecutive days' work, at any metalliferous mine, mill, or metallurgical plant shall be reported immediately to the commissioner of mines. The commissioner is required by section 4268 to render biennial reports to the governor. The published reports are for the calendar year.

On April 1, 1911, the legislature authorized the appointment of a commission to inquire into the subject of workmen's compensation and the operation of such laws elsewhere, but no compensation law has thus far been enacted.

---

[a] Acts of 1912, ch. 33, sec. 13.

[b] Laws of 1911, p. 796.

[c] Statutes and amendments to the code, 1913, ch. 561, secs. 1 and 2.

IDAHO.

Section 207 of the revised code of Idaho for 1909, provides that all fatal or serious accidents at any mine shall be reported immediately to the inspector of mines or his deputy. The inspector is required by section 209 to render an annual report to the governor. The published reports are for the calendar year.

No compensation law has been enacted.

ILLINOIS.

The law[a] of Illinois requires every employer of labor to report, within 30 days, to the State bureau of labor statistics every accident causing death or serious injury involving a loss of 30 or more days' time.

The legislature passed an act[b] June 28, 1913, relating to compensation of injured employees, and established an industrial board for its administration. The act covers every employer of labor, including operators of underground and surface mines and also quarries, and makes it the duty of all employers to report to the industrial board all accidents which entailed a loss to the injured person of one week's time, or which caused death, for which compensation has been paid under the act. The application of the act is elective on the part of the employer. Section 2 of the act provides that election is presumed unless a written notice to the contrary is filed with the industrial board and notice of such declination is given to the employees.

MARYLAND.

The Legislature of Maryland passed an act April 15, 1912, providing elective insurance in all employments. Under the acts of 1910, chapter 153, compulsory insurance is provided for coal mining in Allegany and Garrett counties, accidents to be reported to the county commissioners in the county where the accident occurs and to the State commissioner of insurance.

MICHIGAN.

Section 8 of law No. 163, approved April 25, 1911, requires the county mine inspector to inspect every working mine in his county at least once every 60 days, and section 10 makes it the duty of all operators to render any needed assistance to the inspector in his work. Section 13 provides that the inspector shall report annually to the county clerk all mine accidents causing death or personal injury. The published reports are for the fiscal year ending September 30.

---

[a] Acts of 1907, sec. 1, p. 308.

[b] Laws of 1913, p. 337.

Compensation is provided for accidental deaths or injuries causing at least two weeks' incapacity to earn full wages. The compensation law is elective and is applicable to all industries having one or more persons under contract or hire. Every employer subject to the law is required to keep a record of all injuries, fatal or otherwise, received by his employees and to make a written report thereof within 10 days to the industrial-accident board.

MINNESOTA.

Paragraph 3924, general statutes of Minnesota, 1913, provides for the appointment of a county mine inspector for every county in which at least five mines are in operation. The inspector must visit every mine in his county at least once every 60 days (par. 3926). All operators are required (par. 3931) to give immediate notice to the inspector of all accidents causing loss of life or serious personal injury. The inspector's annual reports are for the fiscal year ending June 30, and are included in the biennial report of the State commissioner of labor (par. 3934).

An elective compensation law provides compensation for injuries causing death or disability for more than two weeks. The law (act of April 24, 1913) applies to all industries except farm and domestic service and interstate or foreign commerce.

MISSOURI.

Section 8462, revised statutes of Missouri, 1909, as amended March 25, 1913, provides that any person having charge of a mine shall report to the State mine inspector all accidents causing loss of life or serious personal injury. The inspector renders an annual report to the governor for the calendar year.

No compensation law has been enacted.

MONTANA.

Sections 1717 and 1720 of the revised code of Montana for 1907 provide that operators of all metalliferous mines in which five or more men are employed shall immediately report to the mine inspector all accidents causing death or serious injury. The inspector's reports are for the fiscal year ending November 30. By act of March 4, 1913, the inspector's office is made a part of the department of labor and industry, and the inspector's reports are to be combined with those of the other branches of the department to form one volume to be published biennially.

A law providing compensation for injuries was enacted in 1909, but was declared unconstitutional, leaving no compensation law in force.

Original from PRINCETON UNIVERSITY

NEVADA.

The Nevada laws of 1912 provide that all mine operators employing wage earners shall render a report to the inspector of mines of all accidents causing death or serious injury. The report of the inspector is for the fiscal year ending November 30.

An elective compensation law (act of Mar. 15, 1913), applicable to all industries employing two or more persons, provides for compensation for accidental injuries resulting in death or incapacity to earn full wages for at least two weeks.

NEW JERSEY.

An act [a] approved by the Legislature of New Jersey March 24, 1904, provides that all accidents resulting in death, or that prevent the injured person from resuming work within two weeks, shall be reported to the department of labor within 24 hours after the expiration of 4 weeks or after the death of the person injured. An act approved April 17, 1914, and effective that date, amended the act of March 24, 1904, by creating the office of inspector of mines and quarries and authorized the appointment of an inspector.

The State has an elective compensation act, and the statutes require every employer to report to the commissioner of labor every accident which prevents an employee from resuming work within two weeks.[b]

NEW YORK.

Chapter 15 of the New York laws of 1910 provides that all accidents causing loss of life or injury incapacitating any person for work, in the operation of a mine or quarry, or in the construction or repair of a tunnel, shall be reported within 48 hours to the commissioner of labor. The published reports of the commissioner of labor are for the fiscal year ending September 30.

Under the workmen's compensation law, approved December 16, 1913, effective July 1, 1914, compensation is provided for accidents causing injury or death to persons engaged in certain enumerated industries classed as hazardous, among which are included mining and quarrying. The law is compulsory as to the industries enumerated. No compensation is allowed for the first 14 days of disability except such medical or surgical treatment and hospital service as may be needed and requested by the injured employee. All accidents for which compensation is payable under the law must be reported by the injured person or by another person in his behalf to the employer and to the compensation commission. Nonfatal accidents must be reported within 10 days after injury and fatal accidents within 30 days after the death of the injured employee.

---

[a] Laws of 1904, ch. 64, sec. 28.

[b] Acts of 1911, ch. 95; Acts of 1912, ch. 136.

OREGON.

An act approved by the Legislature of Oregon, February 18, 1911, provides that any employer of labor who employs more than 3 persons at a time shall report to the commissioner of labor statistics and inspector of factories and workshops all accidental deaths or injuries causing the injured person to cease work.

An act[a] approved February 25, 1913, created a State industrial accident commission and provided for an industrial accident fund. Election on the part of operators to be subject to the law is presumed in the case of certain hazardous industries, including mining and quarrying, unless notice of the employer's declination is filed with the commission; and employers in all other industries may accept the law by affirmative election.

PENNSYLVANIA.

Sections 1 and 5 of an act approved July 19, 1913, provide that all employers shall within 30 days report all accidents resulting in personal injury to the department of labor and industry. The act does not apply to casual employments nor to accidents resulting in disability continuing less than two days.

An act approved June 27, 1913, authorized the governor to appoint an industrial accident commission to inquire into the causes and results of industrial accidents in the mines, mills, factories, and all industrial establishments; to study methods for safeguarding against accidents; to inquire into the subject of fair compensation for accidental injuries and deaths. The commission is to render its report to the general assembly in January, 1915.

SOUTH DAKOTA.

In South Dakota operators of all mines, except those employing no labor other than that of the owner or lessee, are required to report to the inspector of mines all accidents causing death or serious injury. The inspector's reports are for the year ending November 30.

No compensation law has been enacted.

WASHINGTON.

The Legislature of Washington passed an act, approved March 14, 1911, establishing an industrial insurance department to administer a compulsory compensation law applicable to an enumerated list of extra hazardous industries, including mining an quarrying. The law is elective as to other employments. Section 14 requires all employers who are subject to the provisions of the law to render an immediate report of any accident to the industrial insurance department.

---

[a] Laws of 1913, ch. 112.

WISCONSIN.

The Legislature of Wisconsin passed an act on April 3, 1911, effective July 1, 1911, providing for workmen's compensation and creating an industrial commission to administer the act. Section 2394–35 requires all employers of four or more persons to keep a record of all accidents causing death or disability to an employee. Similar records must also be kept by all casualty insurance companies and societies that indemnify employers against liability. All such accidents must be reported within the first five days of every month to the industrial commission.

CLASSIFICATION OF INJURIES IN 1915 STATISTICS.

On account of the enactment of compensation laws in many States, and in order to conform thereto, the bureau's classification of serious and slight injuries for 1915 will be on a 14-day (2 weeks) basis instead of 20-day as at present. Therefore in keeping office records for 1915, it will facilitate the rendering of a report at the close of the year if all companies classify a serious injury as one causing a disability of more than 14 days, and a slight injury as involving a loss of time of more than 1 day and less than 15 days.

TABULATED STATISTICS.

The tables of statistics of metal mine accidents in the United States during the calendar year 1913 follow:

TABLE 1.—*Number of men employed and number of men killed and injured in and about all* **metal** *and* **miscellaneous mineral** *mines (except coal mines) in the United States during the calendar years 1913 and 1912.*

1913.

Kind of mine.	Active operators.	Number of employees.			Number killed.						Number seriously injured. (Involving loss of 20 days or more.)						Number slightly injured. (Involving loss of less than 20 days, but more than one day.)						Widows.	Orphans.
		Underground.	On the surface.	Total.	Underground.[a]	Rate per 1,000 employed.	On the surface.	Rate per 1,000 employed.	**Total, underground and surface.**	Rate per 1,000 employed.	Underground.[a]	Rate per 1,000 employed.	On the surface.	Rate per 1,000 employed.	**Total, underground and surface.**	Rate per 1,000 employed.	Underground.[a]	Rate per 1,000 employed.	On the surface.	Rate per 1,000 employed.	**Total, underground and surface.**	Rate per 1,000 employed.		
Copper	694	39,917	16,222	56,139	203	5.09	33	2.03	**236**	4.20	1,833	45.92	362	22.32	**2,195**	39.10	9,105	228.10	2,063	127.17	**11,168**	198.93	100	180
Gold and miscellaneous metal	4,749	46,143	15,170	61,313	180	3.90	30	1.98	**210**	3.43	508	11.01	124	8.17	**632**	10.31	2,817	61.05	406	26.76	**3,223**	52.57	67	70
Iron	206	29,384	21,749	51,133	122	4.15	43	1.98	**165**	3.22	2,009	68.37	811	37.29	**2,820**	55.15	7,855	267.32	2,798	128.65	**10,653**	208.34	81	178
Lead and zinc (Mississippi Valley only)	409	9,261	3,436	12,697	32	3.46	10	2.91	**42**	3.31	71	7.67	20	5.82	**91**	7.17	1,070	115.54	275	80.03	**1,345**	105.93	25	46
Miscellaneous mineral	329	2,997	8,809	11,806	11	3.67	19	2.16	**30**	2.54	47	15.68	105	11.92	**152**	12.87	210	70.07	482	54.72	**692**	58.61	13	27
Total	6,387	127,702	65,386	193,088	548	.....	135	.....	**683**	.....	4,468	.....	1,422	.....	**5,890**	.....	21,057	.....	6,024	.....	**27,081**	.....	286	501
Average	.....	.....	.....	.....	.....	4.29	....	2.06	.....	3.54	.....	34.99	.....	21.75	.....	30.50	.....	164.89	.....	92.13	.....	140.25	....	....

1912.

Kind of mine.	Active operators.	Underground.	On the surface.	Total.	Underground.[a]	Rate per 1,000 employed.	On the surface.	Rate per 1,000 employed.	**Total, underground and surface.**	Rate per 1,000 employed.	Underground.[a]	Rate per 1,000 employed.	On the surface.	Rate per 1,000 employed.	**Total, underground and surface.**	Rate per 1,000 employed.	Underground.[a]	Rate per 1,000 employed.	On the surface.	Rate per 1,000 employed.	**Total, underground and surface.**	Rate per 1,000 employed.	Widows.	Orphans.
Copper	814	37,539	14,237	51,776	185	4.93	54	3.79	**239**	4.62	1,501	39.99	306	21.49	**1,807**	34.90	10,277	273.77	1,553	109.08	**11,830**	228.48	87	159
Gold and miscellaneous metal	4,137	31,322	12,822	44,144	147	4.69	29	2.26	**176**	3.99	515	16.44	98	7.64	**613**	13.89	2,796	89.27	384	29.95	**3,180**	72.04	71	98
Iron	194	26,799	18,947	45,746	136	5.07	36	1.90	**172**	3.76	1,288	48.06	512	27.02	**1,800**	39.35	6,566	245.01	2,141	113.00	**8,707**	190.33	84	198
Lead and zinc (Mississippi Valley only)	464	10,812	3,520	14,332	48	4.44	6	1.70	**54**	3.77	114	10.54	33	9.38	**147**	10.26	1,634	151.13	215	61.08	**1,849**	129.01	26	62
Miscellaneous mineral	358	3,584	9,617	13,201	6	1.67	14	1.46	**20**	1.52	29	8.09	106	11.02	**135**	10.23	140	39.06	526	54.69	**666**	50.45	5	3
Total	5,967	110,056	59,143	169,199	522	.....	139	.....	**661**	.....	3,447	.....	1,055	.....	**4,502**	.....	21,413	.....	4,819	.....	**26,232**	.....	273	520
Average	.....	.....	.....	.....	.....	4.74	....	2.35	.....	3.91	.....	31.32	.....	17.84	.....	26.61	.....	194.56	.....	81.48	.....	155.04	....	....

[a] Includes shaft accidents.

Original from PRINCETON UNIVERSITY

TABLE 2.—*Number of men killed and injured in and about all* **metal** *and* **miscella-**
year 1913,

NUMBER KILLED.

Kind of mine.	Underground.									
	By fall of rock or ore from roof or wall. 1	By rock or ore while loading at working face. 2	By timber or hand tools. 3	By explosives. 4	By haulage accidents. 5	By falling down chute, winze, raise, or stope. 6	By run of ore from chute or pocket. 7	By drilling accidents. 8	By electricity. 9	By machinery (not including locomotives or drills). 10
Copper	76	2	1	23	20	25	6	......	6	......
Gold and miscellaneous metal	68	1	3	35	2	21	2	......	5	4
Iron	52	7	3	11	12	4	2	......	4	......
Lead and zinc (Mississippi Valley)	16	......	1	7	1	1	......	......	1	......
Miscellaneous mineral	8	......	......	1	......	1	......	......	......	......
Total	220	10	8	77	35	52	10	......	16	4
Percentage of grand total killed	32.21	1.46	1.17	11.28	5.13	7.62	1.46	......	2.34	0.58
Percentage of class total killed	48.04	2.18	1.75	16.81	7.64	11.36	2.18	......	3.49	.87
Number killed per 1,000 employed underground [a]	1.72	.08	.06	.60	.28	.41	.08	......	.13	.03
NUMBER SERIOUSLY INJURED.										
Copper	516	156	197	46	340	106	50	86	1	19
Gold and miscellaneous metal	152	24	44	31	52	44	20	35	2	17
Iron	565	124	325	48	395	71	75	90	4	47
Lead and zinc (Mississippi Valley)	15	11	4	4	18	4	......	3	......	2
Miscellaneous mineral	12	5	1	3	13	1	......	5	......	1
Total	1,260	320	571	132	818	226	145	219	7	86
Percentage of grand total seriously injured	21.39	5.43	9.69	2.24	13.89	3.84	2.46	3.72	0.12	1.46
Percentage of class total slightly injured	29.68	7.54	13.45	3.11	19.27	5.32	3.42	5.16	.17	2.03
Number seriously injured per 1,000 employed underground [a]	9.87	2.51	4.47	1.03	6.41	1.77	1.14	1.71	.05	.67
NUMBER SLIGHTLY INJURED.										
Copper	2,700	858	1,392	78	1,159	449	429	425	11	116
Gold and miscellaneous metal	654	237	316	30	354	139	267	263	6	51
Iron	1,883	844	1,429	106	1,335	131	274	467	33	180
Lead and zinc (Mississippi Valley)	191	274	73	18	116	2	3	109	......	46
Miscellaneous mineral	26	51	14	12	52	......	......	17	2	8
Total	5,454	2,264	3,224	244	3,016	721	973	1,281	52	401
Percentage of grand total slightly injured	20.14	8.36	11.90	0.90	11.14	2.66	3.59	4.73	0.19	1.48
Percentage of class total slightly injured	26.54	11.02	15.69	1.19	14.68	3.51	4.74	6.23	.25	1.95
Number slightly injured per 1,000 employed underground [a]	42.71	17.73	25.25	1.91	23.62	5.64	7.62	10.03	.41	3.14

---

[a] Casualty rates per 1,000 employed is based on underground employees for underground accidents, and on surface employees for surface accidents.

***neous mineral** mines (except coal mines) in the United States during the calendar by causes.*

NUMBER KILLED.

Underground—Continued.						Shaft.						
By mine fires.	By suffocation from natural gases.	By inrush of water.	By stepping on nail.	By other causes.	**Total, underground fatalities or injuries.**	By falling down shafts.	By objects falling down shafts.	By breaking of cables.	By overwinding.	By skip or cage.	By other causes.	**Total, shaft fatalities or injuries.**
11	**12**	**13**	**14**	**15**		**16**	**17**	**18**	**19**	**20**	**21**	
......	......	......	......	12	**171**	9	**7**	......	1	9	6	**32**
......	3	......	......	6	**150**	10	**5**	......	......	13	2	**30**
......	......	......	......	3	**98**	6	**2**	2	1	11	2	**24**
......	......	......	......	1	**28**	1	**1**	......	1	1	......	**4**
......	......	......	......	1	**11**	......	......	......	......	......	......	......
......	3	......	......	23	**458**	26	15	2	3	34	10	**90**
......	0.44	......	......	3.37	**67.06**	3.81	2.20	0.29	0.44	4.98	1.46	**13.18**
......	.66	......	......	5.02	**100.00**	28.89	16.67	2.22	3.33	37.78	11.11	**100.00**
......	.02	......	......	.18	**3.59**	.20	.12	.01	.02	.27	.08	**.70**

NUMBER SERIOUSLY INJURED.

5	......	......	2	222	**1,746**	12	18	......	3	26	28	**87**
1	1	......	1	43	**467**	7	7	......	......	18	9	**41**
......	2	9	15	151	**1,921**	18	22	1	......	34	13	**88**
......	......	......	......	6	**67**	......	1	......	......	2	1	**4**
......	......	......	......	3	**44**	3	......	......	......	......	......	**3**
6	3	9	18	425	**4,245**	40	48	1	3	80	51	**223**
0.10	0.05	0.15	0.31	7.22	**72.07**	0.68	0.81	0.02	0.05	1.36	0.87	**3.79**
.14	.07	.21	.42	10.01	**100.00**	17.94	21.52	.45	1.35	35.87	22.87	**100.00**
.05	.02	.07	.14	3.33	**33.24**	.31	.38	.01	.02	.63	.40	**1.75**

NUMBER SLIGHTLY INJURED.

4	5	3	118	1,172	**8,919**	23	81	2	......	48	32	**186**
......	9	1	35	369	**2,731**	11	28	2	2	24	19	**86**
1	4	4	127	864	**7,682**	20	63	4	3	53	30	**173**
1	......	......	17	161	**1,011**	6	25	......	......	12	16	**59**
......	......	......	3	19	**204**	......	4	......	......	2	......	**6**
6	18	8	300	2,585	**20,547**	60	201	8	5	139	97	**510**
0.02	0.07	0.03	1.11	9.55	**75.87**	0.22	0.74	0.03	0.02	0.51	0.36	**1.88**
.03	.09	.04	1.46	12.58	**100.00**	11.76	39.41	1.57	.98	27.26	19.02	**100.00**
.05	.14	.06	2.35	20.24	**160.90**	.47	1.57	.06	.04	1.09	.76	**3.99**

TABLE 2.—*Number of men killed and injured in and about all* **metal** *and* **miscella-**
year 1913, by

NUMBER KILLED.

Kind of mine.	Surface.									
	By mine cars or mine locomotives.	By railway cars and locomotives.	By run or fall of ore in or from ore bins.	By falls of persons.	By stepping on nail.	By hand tools, axes, bars, etc.	By electricity.	By machinery.	By other causes.	**Total, surface fatalities or injuries.**
	22	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	
Copper	1	2	......	......	......	......	2	3	1	**9**
Gold and miscellaneous metal	2	1	......	2	1	......	1	5	6	**18**
Iron	4	......	2	3	......	......	1	1	4	**15**
Lead and zinc (Mississippi Valley)	2	1	......	......	......	......	1	2	......	**6**
Miscellaneous mineral	......	......	......	......	......	......	......	......	1	**1**
Total	9	4	2	5	1	......	5	11	12	**49**
Percentage of grand total killed	1.32	0.58	0.29	0.73	0.15	......	0.73	1.61	1.76	**7.17**
Percentage of class total killed	18.37	8.17	4.08	10.20	2.04	......	10.20	22.45	24.49	**100.00**
Number killed per 1,000 employed on the surface[a]	.13	.06	.03	.08	.02	......	.08	.17	.18	**.75**
NUMBER SERIOUSLY INJURED.										
Copper	15	10	4	29	2	24	4	36	84	**208**
Gold and miscellaneous metal	6	......	1	4	1	4	1	22	15	**54**
Iron	14	19	......	53	3	50	1	42	95	**277**
Lead and zinc (Mississippi Valley)	......	3	......	3	......	3	......	5	4	**18**
Miscellaneous mineral	3	......	......	2	......	2	......	2	1	**10**
Total	38	32	5	91	6	83	6	107	199	**567**
Percentage of grand total seriously injured	0.65	0.54	0.08	1.55	0.10	1.41	0.10	1.82	3.38	**9.63**
Percentage of class total seriously injured	6.70	5.64	.88	16.05	1.06	14.64	1.06	18.87	35.10	**100.00**
Number seriously injured per 1,000 employed on the surface[a]	.58	.49	.08	1.39	.09	1.27	.09	1.64	3.04	**8.67**
NUMBER SLIGHTLY INJURED.										
Copper	59	17	26	58	23	157	4	87	265	**696**
Gold and miscellaneous metal	28	3	7	29	10	48	3	56	69	**253**
Iron	32	25	12	168	62	358	9	122	362	**1,150**
Lead and zinc (Mississippi Valley)	2	52	2	25	25	29	......	40	77	**252**
Miscellaneous mineral	7	......	2	5	1	5	......	6	6	**32**
Total	128	97	49	285	121	597	16	311	779	**2,383**
Percentage of grand total slightly injured	0.47	0.36	0.18	1.05	0.45	2.20	0.06	1.15	2.88	**8.80**
Percentage of class total slightly injured	5.37	4.07	2.06	11.96	5.08	25.05	.67	13.05	32.69	**100.00**
Number slightly injured per 1,000 employed on the surface[a]	1.96	1.48	.75	4.36	1.85	9.13	.25	4.76	11.91	**36.45**

[a] Casualty rates per 1,000 employed is based on underground employees for underground accidents, and on surface employees for surface accidents.

***neous mineral** mines (except coal mines) in the United States during the calendar causes*—Continued.

NUMBER KILLED.

Surface (where surface mining is done).												Grand total.		
By falls or slides of rock or ore.	By explosives.	By haulage accidents.	By steam shovels.	By falls of persons.	By falls of derricks, booms, etc.	By run or fall of ore in or from ore bins.	By machinery (other than locomotives or steam shovels).	By electricity.	By hand tools.	By other causes.	**Total, surface fatalities or injuries (where surface mining is done).**	**1913**	1912	1911
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**				
4	6	12	......	......	......	......	2	......	......	......	**24**	**236**	239	238
1	2	1	......	......	1	......	3	2	......	2	**12**	**210**	176	193
8	3	11	2	1	......	......	2	1	......	......	**28**	**165**	172	197
1	1	......	......	......	......	......	1	......	......	1	**4**	**42**	54	43
3	......	6	......	......	......	......	2	2	......	5	**18**	**30**	20	24
17	12	30	2	1	1	......	10	5	......	8	**86**	**683**	661	695
2.49	1.76	4.39	0.29	0.15	0.15	......	1.46	0.73	......	1.17	**12.59**	**100.00**	......	......
19.77	13.95	34.88	2.33	1.16	1.16	......	11.63	5.82	......	9.30	**100.00**	......	......	......
.26	.18	.45	.03	.02	.02	......	.15	.08	......	.12	**1.31**	**3.54**	3.91	4.19

NUMBER SERIOUSLY INJURED.

37	16	24	16	18	......	......	11	......	5	27	**154**	**2,195**	1,807	1,326
4	2	4	14	10	3	1	1	......	8	23	**70**	**632**	613	540
102	22	83	79	45	8	3	6	......	74	112	**534**	**2,820**	1,800	2,032
1	1	......	......	......	......	......	......	......	......	......	**2**	**91**	147	177
17	8	15	3	11	......	1	13	3	7	17	**95**	**152**	135	94
161	49	126	112	84	11	5	31	3	94	179	**855**	**5,890**	4,502	4,169
2.73	0.83	2.14	1.90	1.43	0.19	0.08	0.53	0.05	1.59	3.04	**14.51**	**100.00**	......	......
18.83	5.73	14.74	13.10	9.82	1.29	.58	3.63	.35	10.99	20.94	**100.00**	......	......	......
2.46	.75	1.93	1.71	1.28	.17	.08	.47	.05	1.44	2.74	**13.08**	**30.50**	26.61	25.12

NUMBER SLIGHTLY INJURED.

324	77	110	51	163	1	3	38	3	107	490	**1,367**	**11,168**	11,830	9,016
27	4	6	21	17	......	......	8	3	30	37	**153**	**3,223**	3,180	3,078
259	68	181	165	105	22	19	64	2	276	486	**1,648**	**10,653**	8,707	8,690
7	1	1	1	1	......	1	1	......	2	8	**23**	**1,345**	1,849	1,311
64	4	55	2	48	8	......	47	3	39	180	**450**	**692**	666	313
681	154	353	240	335	31	23	158	11	454	1,201	**3,641**	**27,081**	26,232	22,408
2.51	0.57	1.30	0.89	1.24	0.11	0.09	0.58	0.04	1.68	4.44	**13.45**	**100.00**	......	......
18.70	4.23	9.70	6.59	9.20	.85	.63	4.34	.30	12.47	32.99	**100.00**	......	......	......
10.41	2.36	5.40	3.67	5.12	.47	.35	2.42	.17	6.94	18.37	**55.68**	**140.25**	155.04	135.01

TABLE 3.—*Number of men killed in and about all* ***metal*** *and* ***miscellaneous mineral***

State.	Underground.									
	By fall of rock or ore from roof or wall. 1	By rock or ore while loading at working face. 2	By timber or hand tools. 3	By explosives. 4	By haulage accidents. 5	By falling down chute, winze, raise, or stope. 6	By run of ore from chute or pocket. 7	By drilling accidents. 8	By electricity. 9	By machinery (not including locomotives or drills). 10
Alabama	11	......	......	1	4	......	......	......	......	......
Alaska	10	......	......	5	......	2	......	......	......	......
Arizona	29	1	......	12	14	10	1	......	6	......
Arkansas	......	......	......	......	......	......	......	......	......	......
California	10	......	2	7	......	5	......	......	2	2
Colorado	23	......	......	4	1	6	......	......	......	......
Connecticut	......	......	......	......	......	......	......	......	......	......
Florida	......	......	......	......	......	......	......	......	......	......
Georgia	......	......	......	......	......	......	......	......	......	......
Idaho	4	1	1	2	......	4	1	......	......	2
Illinois	......	......	......	......	......	......	......	......	......	......
Iowa	......	......	......	......	......	......	......	......	......	......
Kansas	4	......	......	......	......	......	......	......	......	......
Kentucky	......	......	......	......	......	......	......	......	......	......
Maine	......	......	......	......	......	......	......	......	......	......
Maryland	......	......	......	......	......	......	......	......	......	......
Massachusetts	......	......	......	......	......	......	......	......	......	......
Michigan	31	3	......	4	3	6	4	......	1	......
Minnesota	12	3	3	2	5	2	......	......	......	......
Missouri	9	......	1	7	1	1	......	......	1	......
Montana	20	......	......	5	2	7	2	......	1	......
Nevada	8	1	......	4	......	1	......	......	1	......
New Hampshire	......	......	......	......	......	......	......	......	......	......
New Jersey	5	......	......	1	......	......	......	......	......	......
New Mexico	4	......	......	9	......	2	......	......	......	......
New York	4	......	......	1	1	......	......	......	2	......
North Carolina	......	......	......	2	......	......	......	......	......	......
Ohio	......	......	......	......	......	......	......	......	......	......
Oklahoma	1	......	......	......	......	......	......	......	......	......
Oregon	2	......	......	1	......	......	......	......	......	......
Pennsylvania	......	......	......	......	......	......	......	......	......	......
South Carolina	......	......	......	......	......	......	......	......	......	......
South Dakota	3	......	......	1	1	......	......	......	1	......
Tennessee	5	1	......	......	......	1	......	......	......	......
Texas	......	......	......	......	......	......	......	......	......	......
Utah	14	......	1	1	2	4	2	......	......	......
Vermont	......	......	......	......	......	......	......	......	......	......
Virginia	2	......	......	7	......	......	......	......	......	......
Washington	3	......	......	......	......	1	......	......	......	......
Wisconsin	6	......	......	1	1	......	......	......	1	......
Wyoming	......	......	......	......	......	......	......	......	......	......
Other States	......	......	......	......	......	......	......	......	......	......
Total, 1913	**220**	**10**	**8**	**77**	**35**	**52**	**10**	......	**16**	**4**
Total, 1912	212	2	6	73	35	43	10	2	19	2
Total, 1911	191	(a)	10	62	20	47	14	......	15	10

[a] Included in " Other causes."

mines (except coal mines) in the different States during the calendar year 1913, by causes.

Underground—Continued.						Shaft.						
By mine fires.	By suffocation from natural gases.	By inrush of water.	By stepping on nail.	By other causes.	**Total, underground fatalities.**	By falling down shafts.	By objects falling down shafts.	By breaking of cables.	By overwinding.	By skip or cage.	By other causes.	**Total, shaft fatalities.**
11	**12**	**13**	**14**	**15**		**16**	**17**	**18**	**19**	**20**	**21**	
......	......	......	......	2	**18**	......	......	......	......	......	......	......
......	......	......	......	......	**17**	1	......	......	......	1	......	**2**
......	......	......	......	7	**80**	1	......	......	......	3	......	**4**
......	......	......	......	......	......	......	......	......	......	......	......	......
......	2	......	......	2	**32**	2	1	......	......	5	......	**8**
......	......	......	......	......	**34**	3	2	......	......	2	......	**7**
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	3	**18**	1	......	......	......	1	......	**2**
......	......	......	......	......	......	......	......	......	1	......	......	**1**
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	**4**	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	2	**54**	4	3	2	1	9	1	**20**
......	......	......	......	1	**28**	3	1	......	......	3	......	**7**
......	......	......	......	1	**21**	1	1	......	......	1	......	**3**
......	......	......	......	3	**40**	3	4	......	1	3	6	**17**
......	1	......	......	......	**16**	......	......	......	......	3	......	**3**
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	**6**	1	......	......	......	1	......	**2**
......	......	......	......	......	**15**	......	1	......	......	......	......	**1**
......	......	......	......	......	**8**	......	1	......	......	2	1	**4**
......	......	......	......	......	**2**	......	......	......	......	......	2	**2**
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	**1**	......	......	......	......	......	......	......
......	......	......	......	......	**3**	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	**6**	......	......	......	......	......	......	......
......	......	......	......	......	**7**	1	1	......	......	......	......	**2**
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	1	**25**	4	......	......	......	......	......	**4**
......	......	......	......	1	**1**	......	......	......	......	......	......	......
......	......	......	......	......	**9**	1	......	......	......	......	......	**1**
......	......	......	......	......	**4**	......	......	......	......	......	......	......
......	......	......	......	......	**9**	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	**3**	......	......	**23**	**458**	**26**	**15**	**2**	**3**	**34**	**10**	**90**
1	4	5	......	8	422	40	12	2	......	37	9	100
37	8	12	(*a*)	10	436	57	18	4	......	(*a*)	27	106

TABLE 3.—*Number of men killed in and about all* ***metal*** *and* ***miscellaneous mineral***

causes—

State.	Surface.									
	By mine cars or mine locomotives.	By railway cars and locomotives.	By run or fall of ore in or from ore bins.	By falls of persons.	By stepping on nail.	By hand tools, axes, bars, etc.	By electricity.	By machinery.	By other causes.	**Total, surface fatalities.**
	22	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	
Alabama								1	1	**2**
Alaska								1	1	**2**
Arizona		1							1	**2**
Arkansas										
California	1						1	1	3	**6**
Colorado	2							1		**3**
Connecticut										
Florida										
Georgia									1	**1**
Idaho				1	1			1	1	**4**
Illinois										
Iowa										
Kansas										
Kentucky										
Maine										
Maryland										
Massachusetts										
Michigan	2	1		1			1		2	**7**
Minnesota				1					1	**2**
Missouri	2	1					1	2		**6**
Montana				1			2	3	1	**7**
Nevada										
New Hampshire										
New Jersey										
New Mexico										
New York	1			1						**2**
North Carolina										
Ohio										
Oklahoma										
Oregon										
Pennsylvania										
South Carolina										
South Dakota		1								**1**
Tennessee										
Texas								1		**1**
Utah										
Vermont										
Virginia	1									**1**
Washington										
Wisconsin			2							**2**
Wyoming										
Other States										
Total, 1913	**9**	**4**	**2**	**5**	**1**		**5**	**11**	**12**	**49**
Total, 1912	6	5	2	6			5	11	24	59
Total, 1911	4	8	3		(*a*)		2	8	42	67

a Included in "Other causes."

mines (except coal mines) in the different States during the calendar year 1913, by Continued.

Surface (where surface mining is done).												Grand total.		
By falls or slides of rock or ore.	By explosives.	By haulage accidents.	By steam shovels.	By falls of persons.	By falls of derricks, booms, etc.	By run or fall of ore in or from ore bins.	By machinery (other than locomotives or steam shovels).	By electricity.	By hand tools.	By other causes.	**Total, surface fatalities (where surface mining is done).**	**1913**	1912	1911
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**				
.....	1	.....	.....	.....	.....	.....	1	.....	.....	.....	**2**	**22**	33	10
1	1	.....	.....	.....	.....	.....	1	.....	.....	1	**4**	**25**	21	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**86**	67	70
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	2
.....	.....	.....	.....	.....	1	.....	2	2	.....	1	**6**	**52**	40	38
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**44**	48	43
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1	.....	5	.....	.....	.....	.....	2	2	.....	4	**14**	**14**	6	9
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**1**	.....	2
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**24**	29	23
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**1**	1	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**4**	2	2
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	3
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**1**	**82**	96	134
8	2	11	2	1	.....	.....	1	1	.....	.....	**26**	**63**	50	76
1	1	.....	.....	.....	.....	.....	1	.....	.....	1	**4**	**34**	36	38
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**64**	50	62
1	.....	3	.....	.....	.....	.....	2	.....	.....	.....	**6**	**25**	34	50
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**8**	13	23
1	5	6	.....	.....	.....	.....	.....	.....	.....	.....	**12**	**28**	13	11
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**14**	17	10
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**4**	1	4
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	2	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**3**	1	2
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	**1**	**8**	6	8
.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	**1**	**10**	12	10
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**1**	.....	.....
3	1	3	.....	.....	.....	.....	.....	.....	.....	.....	**7**	**36**	41	49
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**1**	2	.....
.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	**1**	**12**	4	6
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**4**	4	3
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**11**	22	3
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	**1**	1	.....	1
17	**12**	**30**	**2**	**1**	**1**	.....	**10**	**5**	.....	**8**	**86**	**683**	.....	.....
16	21	20	4	3	2	.....	6	1	.....	7	80	.....	661	.....
35	16	21	1	3	1	.....	3	.....	(*a*)	6	86	.....	.....	695

TABLE 4.—*Number of men* **killed** *in and about the various groups*

COPPER MINES.

State.	Underground.									
	By fall of rock or ore from roof or wall. 1	By rock or ore while loading at working face. 2	By timber or hand tools. 3	By explosives. 4	By hauling accidents. 5	By falling down chute, winze, raise, or stope. 6	By run of ore from chute or pocket. 7	By drilling accidents. 8	By electricity. 9	By machinery (not including locomotives or drills). 10
Alaska										
Arizona	27	1		9	14	9			4	
California	3		1	2					1	
Colorado[a]										
Idaho						2				
Michigan	12			2	2	4	2			
Montana	18			5	2	7	2		1	
Nevada	2	1		1						
New Mexico	1			3						
Oregon										
South Dakota										
Utah	10			1	2	2	2			
Washington	2									
Wyoming										
Other States	1					1				
Total, 1913	**76**	**2**	**1**	**23**	**20**	**25**	**6**		**6**	
Total, 1912	87		4	21	9	16	6	1	9	
Total, 1911	82		6	18	5	19	6		6	3

GOLD AND MISCELLANEOUS METAL MINES.

State.	1	2	3	4	5	6	7	8	9	10
Alabama										
Alaska	10			5		2				
Arizona	2			3		1	1		2	
California	6		1	5		5			1	2
Colorado[b]	23			4	1	6				
Georgia										
Idaho	4	1	1	2		2	1			2
Montana	2									
Nevada	6			3		1			1	
New Mexico				6		2				
New York										
North Carolina										
Oregon	2			1						
South Dakota	3			1	1				1	
Tennessee	2									
Texas										
Utah	4		1			1				
Virginia				5						
Washington	1					1				
Wyoming										
Other States	3									
Total, 1913	**68**	**1**	**3**	**35**	**2**	**21**	**2**		**5**	**4**
Total, 1912	49	1	1	27	7	17	2		5	
Total, 1911	40		2	24	7	18	6		7	5

[a] Included in gold and miscellaneous metal mines.

[b] Includes copper and iron mines.

of mines in the United States during the calendar year 1913, by causes.

COPPER MINES.

Underground—Continued.						Shaft.						
By mine fires.	By suffocation from natural gases.	By inrush of water.	By stepping on nail.	By other causes.	**Total, underground fatalities.**	By falling down shafts.	By objects falling down shafts.	By breaking of cables.	By overwinding.	By skip or cage.	By other causes.	**Total, shaft fatalities.**
11	**12**	**13**	**14**	**15**		**16**	**17**	**18**	**19**	**20**	**21**	
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	6	**70**	......	......	......	......	2	......	**2**
......	......	......	......	......	**7**	1	......	......	......	......	......	**1**
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	1	**3**	......	......	......	......	......	......	......
......	......	......	......	2	**24**	2	3	......	......	4	......	**9**
......	......	......	......	3	**38**	3	4	......	1	3	6	**17**
......	......	......	......	......	**4**	......	......	......	......	......	......	......
......	......	......	......	......	**4**	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	**17**	2	......	......	......	......	......	**2**
......	......	......	......	......	**2**	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	**2**	1	......	......	......	......	......	**1**
......	......	......	......	**12**	**171**	**9**	**7**	......	**1**	**9**	**6**	**32**
......	1	......	......	3	**157**	11	2	......	......	14	1	**28**
12	2	......	......	1	**160**	17	5	......	......	......	17	**39**

GOLD AND MISCELLANEOUS METAL MINES.

......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	**17**	1	......	......	......	1	......	**2**
......	......	......	......	1	**10**	1	......	......	......	1	......	**2**
......	2	......	......	2	**24**	1	1	......	......	5	......	**7**
......	......	......	......	......	**34**	3	2	......	......	2	......	**7**
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	2	**15**	1	......	......	......	1	......	**2**
......	......	......	......	......	**2**	......	......	......	......	......	......	......
......	1	......	......	......	**12**	......	......	......	......	3	......	**3**
......	......	......	......	......	**8**	......	1	......	......	......	......	**1**
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	2	**2**
......	......	......	......	......	**3**	......	......	......	......	......	......	......
......	......	......	......	......	**6**	......	......	......	......	......	......	......
......	......	......	......	......	**2**	......	1	......	......	......	......	**1**
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	1	**7**	2	......	......	......	......	......	**2**
......	......	......	......	......	**5**	1	......	......	......	......	......	**1**
......	......	......	......	......	**2**	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	**3**	......	......	......	......	......	......	......
......	**3**	......	......	**6**	**150**	**10**	**5**	......	......	**13**	**2**	30
1	3	......	......	1	**114**	16	2	2	......	10	3	33
17	5	......	......	2	**133**	16	8	3	......	......	3	30

TABLE 4.—*Number of men* ***killed*** *in and about the various groups of*

COPPER MINES.

State.	Surface.									
	By mine cars or mine locomotives.	By railway cars and locomotives.	By run or fall of ore in or from ore bins.	By falls of persons.	By stepping on nail.	By hand tools, axes, bars, etc.	By electricity.	By machinery.	By other causes.	**Total, surface fatalities.**
	22	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	
Alaska										
Arizona		1							1	**2**
California	1									**1**
Colorado [a]										
Idaho										
Michigan		1								**1**
Montana							2	3		**5**
Nevada										
New Mexico										
Oregon										
South Dakota										
Utah										
Washington										
Wyoming										
Other States										
Total, 1913	**1**	**2**					**2**	**3**	**1**	**9**
Total, 1912	1	5		4			3	3	15	**31**
Total, 1911		3	1				1	3	14	**22**

GOLD AND MISCELLANEOUS METAL MINES.

State.	22	23	24	25	26	27	28	29	30	Total, surface fatalities.
Alabama										
Alaska								1	1	**2**
Arizona										
California							1	1	3	**5**
Colorado [b]	2							1		**3**
Georgia										
Idaho				1	1			1	1	**4**
Montana				1					1	**2**
Navada										
New Mexico										
New York										
North Carolina										
Oregon										
South Dakota		1								1
Tennessee										
Texas								1		**1**
Utah										
Virginia										
Washington										
Wyoming										
Other States										
Total, 1913	**2**	**1**		**2**	**1**		**1**	**5**	**6**	**18**
Total, 1912	3						1	5	3	**12**
Total, 1911	3		1				1	3	**17**	**25**

[a] Included in gold and miscellaneous metal mines.

[b] Includes copper and iron mines.

mines in the United States during the calendar year 1913, by causes—Continued.

COPPER MINES.

Surface (where surface mining is done).												Grand total.		
By falls or slides of rock or ore.	By explosives.	By haulage accidents.	By steam shovels.	By falls of persons.	By falls of derricks, booms, etc.	By run or fall of ore in or from ore bins.	By machinery (other than locomotives or steam shovels).	By electricity.	By hand tools.	By other causes.	**Total, surface fatalities (where surface mining is done).**	**1913**	1912	1911
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**				
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**74**	60	61
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**9**	9	2
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**3**	1	3
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**34**	44	63
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**60**	48	50
1	.....	3	.....	.....	.....	.....	2	.....	.....	.....	**6**	**10**	18	12
1	5	6	.....	.....	.....	.....	.....	.....	.....	.....	**12**	**16**	8	4
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2	1	3	.....	.....	.....	.....	.....	.....	.....	.....	**6**	**25**	27	32
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**2**	1	2
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**3**	6	9
4	**6**	**12**	.....	.....	.....	.....	**2**	.....	.....	.....	**24**	**236**	.....	.....
3	13	4	2	.....	.....	.....	.....	.....	.....	1	**23**	.....	239	.....
7	5	2	.....	1	.....	.....	2	.....	.....	.....	**17**	.....	.....	238

GOLD AND MISCELLANEOUS METAL MINES.

31	32	33	34	35	36	37	38	39	40	41	Total	1913	1912	1911
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1	1	.....	.....	.....	.....	.....	1	.....	.....	1	**4**	**25**	9	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**12**	7	8
.....	.....	.....	.....	.....	1	.....	2	2	.....	1	**6**	**42**	31	36
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**44**	46	43
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**21**	28	20
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**4**	2	12
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**15**	16	37
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**9**	3	4
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**2**	1	2
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**3**	1	2
.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	**1**	**8**	6	8
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**3**	2	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**1**	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**9**	12	17
.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	**1**	**7**	2	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**2**	3	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**3**	7	3
1	**2**	**1**	.....	.....	**1**	.....	**3**	**2**	.....	**2**	**12**	**210**	.....	.....
5	1	4	2	1	.....	.....	1	1	.....	2	**17**	.....	176	.....
3	.....	.....	.....	1	.....	.....	.....	.....	.....	1	**5**	.....	.....	193

TABLE 4.—*Number of men **killed** in and about the various groups of*

IRON MINES.

State.	Underground.									
	By fall of rock or ore from roof or wall.	By rock or ore while loading at working face.	By timber or hand tools.	By explosives.	By haulage accidents.	By falling down chute, winze, raise, or stope.	By run of ore from chute or pocket.	By drilling accidents.	By electricity.	By machinery (not including locomotives or drills).
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Alabama	11			1	4					
Georgia										
Michigan	19	3		2	1	2	2		1	
Minnesota	12	3	3	2	5	2				
Missouri										
Nevada										
New Jersey	2			1						
New Mexico	1									
New York	2			1	1				2	
Ohio										
Pennsylvania										
Tennessee		1								
Utah										
Virginia	1			1						
Wisconsin	4			1	1				1	
Other Eastern States				2						
Other Western States										
Total, 1913	**52**	**7**	**3**	**11**	**12**	**4**	**2**		**4**	
Total, 1912	55	1	1	15	17	9	1	1	2	2
Total, 1911	45		1	11	6	10	2			2

LEAD AND ZINC MINES.

State.	1	2	3	4	5	6	7	8	9	10
Arkansas										
Illinois [a]										
Iowa										
Kansas	4									
Kentucky [a]										
Missouri	9		1	7	1	1			1	
Oklahoma	1									
Wisconsin	2									
Total, 1913	**16**		**1**	**7**	**1**	**1**			**1**	
Total, 1912	18			9	1	1	1		3	
Total, 1911	18		1	3	2				2	

MISCELLANEOUS MINERAL MINES.

State.	1	2	3	4	5	6	7	8	9	10
All States, 1913	**8**			**1**		**1**				
All States, 1912	3			1	1					
All States, 1911	6			6						

[a] Includes fluorspar mines that produce lead as a by-product.

mines in the United States during the calendar year 1913, by causes—Continued.

IRON MINES.

Underground—Continued.						Shaft.						
By mine fires.	By suffocation from natural gases.	By inrush of water.	By stepping on nail.	By other causes.	**Total, underground fatalities.**	By falling down shafts.	By objects falling down shafts.	By breaking of cables.	By overwinding.	By skip or cage.	By other causes.	**Total, shaft fatalities.**
11	**12**	**13**	**14**	**15**		**16**	**17**	**18**	**19**	**20**	**21**	
......	......	......	......	2	**18**	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	**30**	2	......	2	1	5	1	• **11**
......	......	......	......	1	**28**	3	1	......	......	3	......	**7**
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	**3**	1	......	......	......	1	......	**2**
......	......	......	......	......	**1**	......	......	......	......	......	......	......
......	......	......	......	......	**6**	......	1	......	......	2	1	**4**
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	**1**	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	**2**	......	......	......	......	......	......	......
......	......	......	......	......	**7**	......	......	......	......	......	......	......
......	......	......	......	......	**2**	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	**3**	**98**	**6**	**2**	**2**	**1**	**11**	**2**	**24**
......	......	5	......	2	**111**	7	4	......	......	13	1	**25**
8	1	12	......	5	**103**	23	3	1	......	......	6	**33**

LEAD AND ZINC MINES.

11	12	13	14	15	Total, underground fatalities.	16	17	18	19	20	21	Total, shaft fatalities.
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	1	......	......	**1**
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	**4**	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	1	**21**	1	1	......	......	1	......	**3**
......	......	......	......	......	**1**	......	......	......	......	......	......	......
......	......	......	......	......	**2**	......	......	......	......	......	......	......
......	......	......	......	**1**	**28**	**1**	**1**	......	**1**	**1**	......	**4**
......	......	......	......	2	**35**	5	4	......	......	......	4	**13**
......	......	......	......	2	**28**	1	2	......	......	......	1	**4**

MISCELLANEOUS MINERAL MINES.

11	12	13	14	15	Total, underground fatalities.	16	17	18	19	20	21	Total, shaft fatalities.
......	......	......	......	1	**11**	......	......	......	......	......	......	......
......	......	......	......	......	**5**	1	......	......	......	......	......	**1**
......	......	......	......	......	**12**	......	......	......	......	......	......	......

TABLE 4.—*Number of men* ***killed*** *in and about the various groups of*

IRON MINES.

State.	Surface.									
	By mine cars or mine locomotives.	By railway cars and locomotives.	By run or fall of ore in or from ore bins.	By falls of persons.	By stepping on nail.	By hand tools, axes, bars, etc.	By electricity.	By machinery.	By other causes.	**Total, surface fatalities.**
	22	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	
Alabama								1	1	**2**
Georgia										
Michigan	2			1			1		2	**6**
Minnesota				1					1	**2**
Missouri										
Nevada										
New Jersey										
New Mexico										
New York	1			1						**2**
Ohio										
Pennsylvania										
Tennessee										
Utah										
Virginia	1									**1**
Wisconsin			2							**2**
Other Eastern States										
Other Western States										
Total, 1913	**4**		**2**	**3**			**1**	**1**	**4**	**15**
Total, 1912	2		2	2			1	1	1	**9**
Total, 1911	1	2	1					2	4	**10**

LEAD AND ZINC MINES.

State.	22	23	24	25	26	27	28	29	30	Total
Arkansas										
Illinois [c]										
Iowa										
Kansas										
Kentucky [c]										
Missouri	2	1					1	2		**6**
Oklahoma										
Wisconsin										
Total, 1913	**2**	**1**					**1**	**2**		**6**
Total, 1912								1	4	**5**
Total, 1911		3							7	**10**

MISCELLANEOUS MINERAL MINES.

State.	22	23	24	25	26	27	28	29	30	Total
All States, 1913									**1**	**1**
All States, 1912								1	1	**2**
All States, 1911										

[a] Included in Eastern States.

[b] Included in Western States.

mines in the United States during the calendar year 1913, by causes—Continued.

IRON MINES.

Surface (where surface mining is done).												Grand total.		
By falls or slides of rock or ore.	By explosives.	By haulage accidents.	By steam shovels.	By falls of persons.	By falls of derricks, booms, etc.	By run or fall of ore in or from ore bins.	By machinery (other than locomotives or steam shovels).	By electricity.	By hand tools.	By other causes.	Total, surface fatalities (where surface mining is done).	1913	1912	1911
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**				
	1						1				**2**	**22**	32	10
													(a)	1
												47	52	69
8	2	11	2	1			1	1			**26**	**63**	50	76
														1
													(b)	(b)
												5	7	20
												1	(b)	(b)
												12	14	6
													(a)	(a)
													2	1
												1	1	2
													(b)	(b)
												3	2	5
												9	9	2
												2		2
													3	2
8	**3**	**11**	**2**	**1**			**2**	**1**			**28**	**165**		
5	5	11		1	2		2			1	27		172	
22	10	14	1		1					3	51			197

LEAD AND ZINC MINES.

31	32	33	34	35	36	37	38	39	40	41	Total	1913	1912	1911
														2
												1	1	1
												4	2	2
													1	
1	1						1			1	4	**34**	36	37
												1	1	
												2	13	1
1	**1**						**1**			**1**	**4**	**42**		
							1				1		54	
										1	1			43

MISCELLANEOUS MINERAL MINES.

31	32	33	34	35	36	37	38	39	40	41	Total	1913	1912	1911
3		**6**					**2**	**2**		**5**	**18**	**30**		
3	2	1		1			2			3	12		20	
3	1	5		1				1		1	12			24

[c] Includes fluorspar mines that produce lead as a by-product.

Digitized by Google Original from PRINCETON UNIVERSITY

TABLE 5.—*Number of men employed, number of days worked, and number of men killed per 1,000 employed in and about all* ***metal*** *and* ***miscellaneous mineral*** *mines (except coal mines) in the different States during the calendar year 1913.*

State.	Number of active operators.	Number of employees.			Days' work done.	Average number of days worked.	Number killed.						Widows.	Orphans.
		Under-ground.	On the surface.	Total.			Under-ground.[a]	Per 1,000 employed.	On the surface.	Per 1,000 employed.	**Total.**	Per 1,000 employed.		
Alabama	24	3,351	1,861	5,212	1,485,189	285	18	5.37	4	2.15	**22**	4.22	9	16
Alaska[b]	350	5,925	2,075	8,000	2,096,782	263	19	3.21	6	2.89	**25**	3.13	2	3
Arizona	426	13,031	3,458	16,489	5,194,231	315	84	6.45	2	.58	**86**	5.22	35	27
Arkansas	8	28	309	337	87,046	258	....	....	....	....	....	....	....	....
California	1,054	7,437	4,039	11,476	3,115,698	271	40	5.38	12	2.97	**52**	4.53	21	25
Colorado[c]	1,013	14,382	1,567	15,949	4,767,651	299	41	2.85	3	1.91	**44**	2.76	19	....
Connecticut	5	147	108	255	74,004	290	....	....	....	....	....	....	....	....
Florida	27	18	4,520	4,538	1,150,343	253	....	....	14	3.10	**14**	3.09	3	10
Georgia	21	131	313	444	101,867	229	....	....	1	3.19	**1**	2.25	....	....
Idaho	588	4,096	1,673	5,769	1,634,392	283	20	4.88	4	2.39	**24**	4.16	1	4
Illinois	12	317	194	511	135,732	266	1	3.15	....	....	**1**	1.96	1	1
Iowa	9	215	16	231	61,042	264	....	....	....	....	....	....	....	....
Kansas	40	440	168	608	147,034	242	4	9.09	....	....	**4**	6.58	3	....
Kentucky	15	228	288	516	94,493	183	....	....	....	....	....	....	....	....
Maine	5	....	121	121	32,178	266	....	....	....	....	....	....	....	....
Maryland	16	14	345	359	104,195	290	....	....	....	....	....	....	....	....
Massachusetts	3	34	14	48	14,028	202	....	....	....	....	....	....	....	....
Michigan	84	19,531	8,643	28,174	7,878,782	280	74	3.79	8	.92	**82**	2.91	45	133
Minnesota	54	8,937	10,609	19,546	5,976,512	306	35	3.92	28	2.64	**63**	3.22	32	64
Missouri	283	7,053	2,694	9,747	2,454,713	252	24	3.40	10	3.71	**34**	3.49	19	44
Montana	384	15,192	4,308	19,500	6,177,500	317	57	3.75	7	1.62	**64**	3.28	32	54
Nevada	566	4,948	2,368	7,316	2,242,654	307	19	3.84	6	2.53	**25**	3.42	8	10
New Hampshire	7	18	65	83	16,010	193	....	....	....	....	....	....	....	....
New Jersey	7	1,072	361	1,433	443,973	310	8	7.46	....	....	**8**	5.58	5	14
New Mexico	139	2,015	1,751	3,766	914,038	243	16	7.94	12	6.85	**28**	7.43	11	16
New York[d]	36	2,237	1,108	3,345	930,515	278	12	5.36	2	1.81	**14**	4.19	6	13
North Carolina	60	756	411	1,167	228,245	186	4	5.16	....	....	**4**	3.43	2	3
Ohio	7	280	25	305	85,807	281	....	....	....	....	....	....	....	....
Oklahoma	36	368	273	641	148,132	231	1	2.72	....	....	**1**	1.56	1	1
Oregon	261	709	640	1,349	262,126	194	3	4.23	....	....	**3**	2.22	2	2
Pennsylvania	34	111	545	656	171,463	261	....	....	....	....	....	....	....	....
South Carolina	6	22	422	444	96,985	318	....	....	....	....	....	....	....	....
South Dakota	74	2,774	1,129	3,903	720,169	185	6	2.16	2	1.77	**8**	2.05	3	5
Tennessee	36	1,275	1,876	3,151	829,277	263	9	7.06	1	.53	**10**	3.17	5	9
Texas	8	241	109	350	102,695	291	....	....	1	9.17	**1**	2.86	1	3
Utah	285	4,799	3,073	7,872	2,541,022	323	29	6.04	7	2.28	**36**	4.59	7	10
Vermont	10	76	67	143	33,236	232	1	13.16	....	....	**1**	6.99	1	1
Virginia	28	1,129	1,467	2,596	710,805	274	10	8.86	2	1.36	**12**	4.62	7	18

Washington	231	843	459	1,302	260,828	200	4	4.74			4	3.07	1	2
Wisconsin	61	3,267	1,063	4,330	1,245,478	288	9	2.75	2	1.88	11	2.54	3	10
Wyoming	71	255	361	616	135,280	220								
Other States [e]	3		490	490	175,705	359			1	2.04	1	2.04	1	3
Total, 1913	**6,387**	**127,702**	**65,386**	**193,088**	**55,077,855**	**285**	**548**	**4.29**	**135**	**2.06**	**683**	**3.54**	**286**	**501**
Total, 1912	5,967	110,056	59,143	169,199	48,498,510	287	522	4.74	139	2.35	661	3.91	273	520
Total, 1911	5,232	104,623	61,356	165,979	46,826,573	282	542	5.18	153	2.49	695	4.19	297	600

[a] Includes those killed in shaft accidents.
[b] Reported by Sumner S. Smith, United States mine inspector, Juneau, Alaska.
[c] Reported by T. R. Henahen, commissioner of metalliferous mines, Denver, Colo.
[d] Reported by W. W. Jones, State mine inspector, Albany, N. Y.
[e] Includes Louisiana, Rhode Island, and West Virginia.

TABLE 6.—*Number of men employed, number of days worked, and number of men killed per 1,000 employed in and about the* **copper** *mines in the United States during the calendar year 1913.*

State.	Number of active operators.	Number of employees.			Days' work done.	Average number of days worked.	Number killed.						Widows.	Orphans.
		Under-ground.	On the surface.	Total.			Under-ground.	Per 1,000 employed.	On the surface.	Per 1,000 employed.	**Total.**	Per 1,000 employed.		
Alaska	13	235	200	435	145,657	335								
Arizona	182	11,679	2,788	14,467	4,716,629	326	72	6.17	2	0.72	74	5.05	30	18
California	43	1,317	429	1,746	510,357	292	8	6.07	1	2.33	9	5.15	4	5
Colorado [a]														
Idaho	57	398	104	502	140,726	280	3	7.54			3	5.98		2
Michigan	37	8,047	4,072	12,119	3,132,860	259	33	4.10	1	.25	34	2.81	19	75
Montana	72	13,332	3,520	16,852	5,491,322	326	55	4.13	5	1.42	60	3.56	30	54
Nevada	71	1,035	906	1,941	627,492	323	4	3.86	6	6.62	10	5.15	3	3
New Mexico	31	470	1,090	1,560	534,604	343	4	8.51	12	11.01	16	10.26	6	8
Oregon	24	112	148	260	34,209	132								
South Dakota	4	6	20	26	2,193	84								
Utah	65	2,199	2,457	4,656	1,606,918	345	19	8.64	6	2.44	25	5.37	7	10
Washington	69	397	241	638	167,669	262	2	5.04			2	3.13		
Wyoming	19	73	29	102	15,990	157								
Other States [b]	7	617	218	835	242,640	291	3	4.86			3	3.59	1	5
Total, 1913	**694**	**39,917**	**16,222**	**56,139**	**17,369,266**	**327**	**203**	**5.09**	**33**	**2.03**	**236**	**4.20**	**100**	**180**
Total, 1912	814	37,539	14,237	51,776	15,831,250	306	185	4.93	54	3.79	239	4.62	87	159
Total, 1911	396	31,557	13,136	44,693	13,774,325	308	199	6.31	39	2.97	238	5.33	91	195

[a] Included in gold and miscellaneous metal mines.
[b] To avoid disclosing information relating to individual operators, statistics for those States in which there were less than 3 operators are not shown separately. In 1913 these States were Maryland, North Carolina, Pennsylvania, Tennessee, Vermont, and Virginia.

TABLE 7.—*Number of men employed, number of days worked, and number of men killed per 1,000 employed in and about the* ***gold*** *and* ***miscellaneous metal*** *mines in the United States during the calendar year 1913.*

State.	Number of active operators.	Number of employees.			Days' work done.	Average number of days worked.	Number killed.						Widows.	Orphans.
		Under-ground.	On the surface.	Total.			Under-ground.[a]	Per 1,000 employed.	On the surface.	Per 1,000 employed.	**Total.**	Per 1,000 employed.		
Alabama	3	25	65	90	25,032	278	...	...	...	...	...	...	...	...
Alaska	337	5,690	1,875	7,565	1,951,125	258	19	3.34	6	3.20	**25**	3.30	2	3
Arizona	239	1,349	635	1,984	467,090	235	12	8.90	...	...	**12**	6.05	5	9
California	990	6,039	3,465	9,504	2,538,133	267	31	5.13	11	3.17	**42**	4.42	16	20
Colorado[b]	1,013	14,382	1,567	15,949	4,767,651	299	41	2.85	3	1.91	**44**	2.76	19	...
Georgia	8	61	134	195	40,816	209	...	...	...	...	...	...	...	...
Idaho	522	3,633	1,538	5,171	1,472,143	285	17	4.68	4	2.60	**21**	4.06	1	2
Montana	309	1,812	781	2,593	669,174	258	2	1.10	2	2.56	**4**	1.54	2	...
Nevada	487	3,884	1,405	5,289	1,591,057	301	15	.86	...	...	**15**	2.84	5	7
New Mexico	97	1,442	538	1,980	330,739	167	9	6.24	...	...	**9**	4.55	3	1
New York[c]	3	105	24	129	37,539	291	...	...	...	...	...	...	...	...
North Carolina	13	216	84	300	78,675	262	2	9.26	...	...	**2**	6.67	1	2
Oregon	235	596	451	1,047	217,067	207	3	5.03	...	...	**3**	2.87	2	2
South Dakota	67	2,755	1,099	3,854	714,766	185	6	2.18	2	1.82	**8**	2.08	3	5
Texas	3	216	47	263	82,130	312	...	...	1	21.28	**1**	3.80	1	3
Utah	206	2,514	551	3,065	890,780	291	9	3.58	...	...	**9**	2.94	...	...
Virginia	7	236	233	469	137,838	294	6	25.42	1	4.29	**7**	14.93	3	8
Washington	158	436	208	644	92,240	143	2	4.59	...	...	**2**	3.11	1	2
Wyoming	43	76	90	166	20,383	123	...	...	...	...	...	...	...	...
Other States[d]	9	676	380	1,056	309,230	293	6	8.88	...	...	**6**	5.68	3	6
Total 1913	**4,749**	**46,143**	**15,170**	**61,313**	**16,433,608**	**268**	**180**	**3.90**	**30**	**1.98**	**210**	**3.43**	**67**	**70**
Total, 1912	4,137	31,322	12,822	44,144	12,229,761	277	117	4.69	29	2.26	**176**	3.99	71	98
Total, 1911	3,817	35,176	13,743	48,919	13,512,633	276	163	4.63	30	2.18	**193**	3.95	61	118

[a] Includes those killed in shaft accidents.
[b] Reported by T. R. Henahen, commissioner of mines, Denver, Colo.
[c] Reported by W. W. Jones, State mine inspector, Albany, N. Y.
[d] Includes Arkansas, New Jersey, Oklahoma, South Carolina, Tennessee, and Wisconsin.

TABLE 8.—*Number of men employed, number of days worked, and number of men killed per 1,000 employed in and about the* **iron** *mines in the United States during the calendar year 1913.*

State.	Number of active operators.	Number of employees.			Days' work done.	Average number of days worked.	Number killed.						Widows.	Orphans.
		Underground.	On the surface.	Total.			Underground.	Per 1,000 employed.	On the surface.	Per 1,000 employed.	**Total.**	Per 1,000 employed.		
Alabama	17	3,314	1,755	5,069	1,453,165	287	18	5.43	4	2.28	**22**	4.34	9	16
Michigan	42	11,288	4,502	15,790	4,669,852	296	41	3.63	6	1.33	**47**	2.98	25	58
Minnesota	54	8,937	10,609	19,546	5,976,512	306	35	3.92	28	2.64	**63**	3.22	32	64
Missouri	8	26	151	177	31,775	180	......	......	......	......	......	......	......	......
Nevada	3	28	12	40	14,137	353	......	......	......	......	......	......	......	......
New Jersey	5	642	336	978	301,623	308	5	7.79	......	......	**5**	5.11	3	8
New Mexico	3	17	42	59	14,629	248	1	58.82	......	......	**1**	16.95	1	3
New York [a]	10	1,358	786	2,144	630,336	294	10	7.36	2	2.54	**12**	5.60	4	9
Ohio	3	34	6	40	8,013	200	......	......	......	......	......	......	......	......
Pennsylvania	11	64	341	405	108,960	269	......	......	......	......	......	......	......	......
Tennessee	14	307	714	1,021	211,803	207	1	3.26	......	......	**1**	.98	1	4
Utah	5	25	6	31	7,374	238	......	......	......	......	......	......	......	......
Virginia	7	595	1,135	1,730	458,875	265	2	3.36	1	.88	**3**	1.73	3	5
Wisconsin	7	2,287	704	2,991	878,415	294	7	3.06	2	2.84	**9**	3.01	2	10
Other Eastern States [b]	9	297	423	720	184,109	256	2	6.73	......	......	**2**	2.78	1	1
Other Western States [b]	8	165	227	392	114,851	293	......	......	......	......	......	......	......	......
Total, 1913	**206**	**29,384**	**21,749**	**51,133**	**15,064,429**	**295**	**122**	**4.15**	**43**	**1.98**	**165**	**3.23**	**81**	**178**
Total, 1912	194	26,799	18,947	45,746	13,035,485	285	136	5.07	36	1.90	**172**	3.76	84	198
Total, 1911	207	25,461	20,492	45,953	12,749,121	277	136	5.34	61	2.98	**197**	4.29	114	237

[a] Reported by W. W. Jones, State mine inspector, Albany, N. Y.

[b] To avoid disclosing information relating to individual operators, statistics for those States in which there were less than 3 operators are not shown separately. In 1913, these States were as follows: Eastern States—Connecticut, Georgia, Kentucky, Maryland, Massachusetts, North Carolina, and West Virginia; Western States—Arizona, California, Idaho, Montana, Washington, and Wyoming.

Original from PRINCETON UNIVERSITY

TABLE 9.—*Number of men employed, number of days worked, and number of men killed per 1,000 employed in and about the* ***lead*** *and* ***zinc*** *mines (Mississippi Valley) in the United States during the calendar year 1913.*

State.	Number of active operators.	Number of employees.			Days' work done.	Average number of days worked.	Number killed.						Widows.	Orphans.
		Under-ground.	On the surface.	Total.			Under-ground.	Per 1,000 employed.	On the surface.	Per 1,000 employed.	**Total.**	Per 1,000 employed.		
Arkansas	6	28	9	37	5,026	136								
Illinois [a]	12	317	194	511	135,732	266	1	3.15			**1**	1.96	1	1
Iowa	3	3	2	5	928	186								
Kansas	37	388	144	532	126,229	237	4	10.31			**4**	7.52	3	
Kentucky [a]	10	215	115	330	74,573	226								
Missouri	264	7,006	2,520	9,526	2,414,561	253	24	3.43	10	3.97	**34**	3.57	19	44
Oklahoma	26	335	105	440	106,808	243	1	2.99			**1**	2.27	1	1
Wisconsin	51	969	347	1,316	362,812	276	2	2.06			**2**	1.52	1	
Total, 1913	**409**	**9,261**	**3,436**	**12,697**	**3,226,669**	**254**	**32**	**3.46**	**10**	**2.91**	**42**	**3.31**	**25**	**46**
Total, 1912	464	10,812	3,520	14,332	3,782,944	265	48	4.44	6	1.70	**54**	3.77	26	62
Total, 1911	483	9,247	3,274	12,521	3,202,339	256	32	3.46	11	3.36	**43**	3.43	26	40

[a] Includes fluorspar mines that produce lead as a by-product.

TABLE 10.—*Number of men employed, number of days worked, and number of men killed per 1,000 employed in and about the* ***miscellaneous mineral*** *mines in the United States during the calendar year 1913.*

State.	Number of active operators.	Number of employees.			Days' work done.	Average number of days worked.	Number killed.						Widows.	Orphans.
		Under-ground.	On the surface.	Total.			Under-ground.[a]	Per 1,000 employed.	On the surface.	Per 1,000 employed.	**Total.**	Per 1,000 employed.		
Alabama	4	12	41	53	6,992	132								
Arizona	4	1	35	36	10,312	286								
California	20	81	137	218	66,408	305	1	12.35			**1**	4.59	1	
Colorado [a]														
Connecticut	4		71	71	20,460	288								
Florida	27	18	4,520	4,538	1,150,313	253			14	3.10	**14**	3.09	3	10
Georgia	11	70	142	212	52,951	250			1	7.04	**1**	4.72		
Idaho	**7**	**38**	**25**	**63**	**10,058**	**160**								

Iowa	6	212	14	226	60,114	266							
Kansas	3	52	24	76	20,805	274							
Kentucky	4	13	73	86	17,920	208							
Maine	5		121	121	32,178	266							
Maryland	13	4	176	180	53,705	298							
Michigan	5	196	69	265	76,070	287			1	14.49	1	3.77	1	
Missouri	11	21	23	44	8,377	190							
Nevada	5	1	45	46	9,968	217							
New Hampshire	7	18	65	83	16,010	193							
New Mexico	8	86	81	167	34,066	204	2	23.26			2	11.98	1	4
New York [b]	23	774	298	1,072	262,640	245	2	2.58			2	1.87	2	4
North Carolina	45	390	262	652	94,845	145							
Ohio	4	246	19	265	77,794	294							
Oklahoma	9	33	153	186	39,974	215							
Pennsylvania	22	47	203	250	62,470	250							
South Carolina	4	17	416	433	95,395	220							
South Dakota	3	13	10	23	3,210	140							
Tennessee	18	177	947	1,124	307,347	273	2	11.30	1	1.06	3	2.67	2	
Texas	5	25	62	87	20,565	236							
Utah	9	61	59	120	35,950	300	1	16.39	1	16.13	2	16.67		
Vermont	9	58	62	120	26,336	219	1	17.24			1	8.33	1	1
Virginia	13	295	97	392	113,592	290	2	6.78			2	5.10	1	5
Wyoming	8	9	31	40	7,739	193							
Other States [c]	13	29	528	557	189,289	340			1	1.90	1	1.81	1	3
Total, 1913	**329**	**2,997**	**8,809**	**11,806**	**2,983,883**	**253**	**11**	**3.67**	**19**	**2.16**	**30**	**2.54**	**13**	**27**
Total, 1912	358	3,584	9,617	13,201	3,619,070	274	6	1.67	14	1.46	20	1.52	5	3
Total, 1911	329	3,182	10,711	13,893	3,588,155	258	12	3.77	12	1.12	24	1.73	5	10

---

[a] Included in gold and miscellaneous metal mines.

[b] Reported by W. W. Jones, State mine inspector, Albany, N. Y.

[c] To avoid disclosing information relating to individual operators, statistics for those States in which there were less than 3 operators are not shown separately. In 1913 these States were Louisiana, Massachusetts, Montana, New Jersey, Oregon, Rhode Island, Washington, and Wisconsin.

TABLE 11.—*Number of men* ***seriously injured*** *in and about all* ***metal*** *and* ***miscel-***
the calendar year

State.	Underground.									
	By fall of rock or ore from roof or wall.	By rock or ore while loading at working face.	By timber or hand tools.	By explosives.	By haulage accidents.	By falling down chute, winze, raise, or stope.	By run of ore from chute or pocket.	By drilling accidents.	By electricity.	By machinery (not including locomotives or drills).
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Class A.										
Arizona	242	42	84	21	152	42	6	25	.....	7
California	35	6	10	4	9	8	3	13	2	9
Colorado	32	5	5	7	9	12	1	.....	.....	.....
Idaho	23	5	2	2	6	4	6	5	.....	4
Michigan	237	143	160	20	210	45	28	74	.....	29
Minnesota	305	16	209	26	153	36	45	21	.....	10
Missouri	9	5	3	4	11	3	.....	2	.....	2
Montana	133	1	46	7	56	47	36	9	.....	2
Nevada	33	10	16	5	14	9	3	16	1	1
New Jersey	10	2	3	2	7	1	2	1	.....	2
New York	15	30	3	5	25	.....	3	12	.....	2
Oregon	2	.....	1	.....	.....	2	.....	.....	.....	.....
South Dakota	5	2	1	1	4	1	4	.....	.....	.....
Washington	.....	.....	2	7	.....	1	.....	4	.....	.....
Wisconsin	41	8	10	1	34	5	4	3	4	6
Class B.										
Alabama	68	38	8	5	91	2	.....	24	.....	7
Alaska	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Arkansas	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
Connecticut	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
Florida	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Georgia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Illinois	.....	.....	.....	.....	2	.....	.....	.....	.....	.....
Indiana, Louisiana, and West Virginia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iowa	1	.....	.....	.....	2	.....	.....	.....	.....	.....
Kansas	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kentucky	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maine	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maryland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Massachusetts	1	.....	.....	.....	1	.....	.....	.....	.....	.....
New Hampshire	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Mexico	3	.....	.....	2	.....	1	.....	.....	.....	.....
North Carolina	2	.....	.....	1	2	.....	.....	2	.....	.....
Ohio	.....	.....	.....	.....	2	.....	.....	1	.....	.....
Oklahoma	2	.....	.....	.....	2	.....	.....	.....	.....	.....
Pennsylvania	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Carolina	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tennessee	4	7	.....	2	4	1	.....	3	.....	1
Texas	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Utah	49	.....	6	7	22	5	3	3	.....	4
Vermont	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
Virginia	4	.....	.....	3	.....	.....	1	1	.....	.....
Wyoming	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total, 1913	**1,260**	**320**	**571**	**132**	**818**	**228**	**145**	**219**	**7**	**86**
Total, 1912	1,102	261	313	153	579	201	113	203	7	51
Total, 1911	1,214	.....	267	139	606	161	105	190	3	106

laneous mineral *mines (except coal mines) in the United States (by States) during 1913, by causes.*

Underground—Continued.						Shaft.						
By mine fires.	By suffocation from natural gases.	By inrush of water.	By stepping on nail.	By other causes.	**Total, underground.**	By falling down shafts.	By objects falling down shafts.	By breaking of cables.	By overwinding.	By skip or cage.	By other causes.	**Total, shaft.**
11	**12**	**13**	**14**	**15**		**16**	**17**	**18**	**19**	**20**	**21**	
2	......	......	2	77	**702**	1	2	......	1	12	6	**22**
......	......	......	......	21	**120**	1	2	......	......	8	2	**13**
......	......	......	......	1	**72**	1	1	......	......	6	3	**11**
1	......	......	1	8	**67**	......	1	......	......	......	2	**3**
......	2	......	5	141	**1,094**	11	16	......	......	22	14	**63**
......	......	9	6	54	**890**	10	13	......	......	10	7	**40**
......	......	......	......	2	**41**	......	1	......	......	2	......	**3**
3	......	......	......	39	**379**	1	6	......	1	3	14	**25**
......	1	......	......	7	**116**	4	2	......	......	5	1	**12**
......	......	......	......	3	**33**	......	......	1	......	......	......	**1**
......	......	......	1	8	**104**	1	......	......	......	5	......	**6**
......	......	......	......	......	**5**	......	......	......	......	......	......	......
......	......	......	......	1	**19**	1	1	......	......	......	......	**2**
......	......	......	......	......	14	......	......	......	......	......	......	......
......	......	......	2	43	**161**	3	2	......	......	2	2	**9**
......	......	......	1	10	**254**	......	......	......	......	......	......	......
......	......	......	......	......	**1**	1	......	......	......	......	......	**1**
......	......	......	......	......	**1**	......	......	......	......	......	......	......
......	......	......	......	......	**1**	......	......	......	......	......	......	......
......	......	......	......	1	**1**	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	**2**	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	**3**	......	......	......	......	......	......	......
......	......	......	......	......	**2**	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	**2**	......	......	......	......	......	......	......
......	......	......	......	1	**1**	......	......	......	......	......	......	......
......	......	......	......	1	**7**	......	......	......	......	......	......	......
......	......	......	......	1	**8**	......	......	......	......	1	......	**1**
......	......	......	......	......	**3**	......	......	......	......	......	......	......
......	......	......	......	......	**4**	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	1	**23**	3	1	......	......	......	......	**4**
......	......	......	......	......	**1**	......	......	......	......	......	......	......
......	......	......	......	5	**104**	1	......	......	1	4	......	**6**
......	......	......	......	......	**1**	......	......	......	......	......	......	......
......	......	......	......	......	**9**	1	......	......	......	......	......	**1**
......	......	......	......	......	......	......	......	......	......	......	......	......
6	**3**	**9**	**18**	**425**	**4,245**	**40**	**48**	**1**	**3**	**80**	**51**	**223**
1	5	3	9	269	**3,270**	35	50	3	......	71	18	**177**
......	1	......	......	318	**3,110**	42	40	2	12	......	57	**153**

TABLE 11.—*Number of men* ***seriously injured*** *in and about all* ***metal*** *and* ***miscel-***
calendar year 1913,

State.	Surface.									
	By mine cars and mine locomotives.	By railway cars and locomotives.	By run or fall of ore in or from ore bins.	By falls of persons.	By stepping on nail.	By hand tools, axes, bars, etc.	By electricity.	By machinery.	By other causes.	**Total, surface.**
	22	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	
Class A.										
Arizona	8	3	1	10	1	6	1	9	40	**79**
California		1		1		1		8	5	**16**
Colorado	2			1				6	2	**11**
Idaho				1		2		3	4	**10**
Michigan	3	9	3	32	4	32	1	33	61	**178**
Minnesota	4	15		22		26	1	14	50	**132**
Missouri		2		1		1		4	2	**10**
Montana	5			9		6	3	7	13	**43**
Nevada	3					1		1	3	**8**
New Jersey	1			1					4	**6**
New York	2			1				1	1	**5**
Oregon					1					**1**
South Dakota	1			1						**2**
Washington								1	1	**2**
Wisconsin	1			4		4		3	5	**17**
Class B.										
Alabama		1		3		1		1	1	**7**
Alaska									1	**1**
Arkansas										
Connecticut										
Florida										
Georgia										
Illinois		1				1		1		**3**
Indiana, Louisiana, and West Virginia										
Iowa										
Kansas										
Kentucky										
Maine										
Maryland										
Massachusetts										
New Hampshire										
New Mexico								2		**2**
North Carolina	1							2	1	**4**
Ohio										
Oklahoma				1						**1**
Pennsylvania										
South Carolina										
Tennessee	3		1	3		2		4	1	**14**
Texas										
Utah	2							7	4	**13**
Vermont										
Virginia	2									**2**
Wyoming										
Total, 1913	**38**	**32**	**5**	**91**	**6**	**83**	**6**	**107**	**199**	**567**
Total, 1912	32	27	19	87	6	63	4	104	123	**465**
Total, 1911	50	15	16				1	92	182	**356**

laneous mineral mines (except coal mines) in the United States (by States) during the by causes—Continued.

Surface (where surface mining is done).												Grand total.		
By falls or slides of rock or ore.	By explosives.	By haulage accidents.	By steam shovels.	By falls of persons.	By falls of derricks, booms, etc.	By run or fall of ore in or from ore bins.	By machinery (other than locomotives or steam shovels).	By electricity.	By hand tools.	By other causes.	Total, surface (where surface mining is done).	1913	1912	1911
31	32	33	34	35	36	37	38	39	40	41				
1	1	2									4	807	549	336
3		1	13	8	2				8	22	57	206	167	123
							1				1	95	137	128
1	1										2	82	61	43
1	1						1				3	1,338	1,213	1,268
96	20	76	76	43	7	3	5		73	111	510	1,572	857	1,131
1	1	1									3	57	102	140
	1		1								2	449	224	138
14	5	7	6	3	1		8		4		48	184	162	75
				2							2	42	55	29
3			5								8	123	70	83
												6	5	4
												23	25	39
												16	3	6
				2						2	4	191	82	58
		5		1					1		7	268	287	153
1											1	4	25	
		1									1	2	3	2
												1		1
7	6	10	1	9		1	8	3	5	4	54	55	39	34
							2				2	2		9
												5	15	7
2		2							2	8	14	14	29	
												3		4
												2	3	9
														5
										1	1	1		3
												2		
												1		
5		4	3	2						12	26	35	13	30
1							1			2	4	17	13	11
												3	5	9
	1										1	6	2	2
		1								1	2	2	6	
													10	
1		2					1				4	45	75	52
												1		
22	10	11	7	13			3		1	16	83	206	237	204
							1				1	2	6	
2		2		1	1	1					7	19	21	33
	2	1									3	3	1	
161	**49**	**126**	**112**	**84**	**11**	**5**	**31**	**3**	**94**	**179**	855	**5,890**		
124	54	77	70	46	13	1	25	6	45	129	590		4,502	
94	41	123	64	50	10	4	46	3		115	550			4,169

TABLE 12.—*Number of men* ***slightly injured*** *in and about all* ***metal*** *and* ***miscella-***
calendar year

State.	Underground.									
	By fall of rock or ore from roof or wall.	By rock or ore while loading at working face.	By timber or hand tools.	By explosives.	By haulage accidents.	By falling down chute, winze, raise, or stope.	By run of ore from chute or pocket.	By drilling accidents.	By electricity.	By machinery (not including locomotives or drills).
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Class A.										
Arizona	1,325	264	699	44	504	192	135	128	8	23
California	107	41	45	1	64	22	23	26		13
Colorado	51	8	9	7	20	14	1	6	2	
Idaho	160	67	78	1	56	29	13	77	1	9
Michigan	1,036	740	605	42	615	95	193	337	1	114
Minnesota	835	161	760	51	355	47	102	72	8	53
Missouri	105	227	66	12	103	2	1	83		40
Montana	726	18	417	10	297	189	190	64	2	15
Nevada	203	30	115	8	116	36	45	57	1	20
New Jersey	47	10	51	4	46	8	64	21		9
New York	25	111	15	6	82	5	5	49	5	5
Oregon	6	2	2		1			4		
South Dakota	38	45	20	8	56	10	119	34		
Washington	4	1	2	1	3		2	2		
Wisconsin	262	41	103	16	108	9	12	25	21	41
Class 1										
Alabama	134	387	137	4	454	17	2	169		21
Alaska [a]	1		1	2	1		2			
Arkansas	1									
Connecticut										
Florida										
Georgia	3	2	1			1		2		
Illinois	2	3	2	1			1	1		
Indiana, Louisiana, and West Virginia										
Iowa		15	4	1	7			2		4
Kansas	16	1	1							1
Kentucky	5									1
Maine										
Maryland										
Massachusetts				1						
New Hampshire										
New Mexico	10	2	1		4	1	1	1		
North Carolina		2	3		1			1		
Ohio	2	5	3	1	9			5	1	
Oklahoma	48	6	4	1	4		1	17		2
Pennsylvania										
South Carolina										
Tennessee	25	50	4	6	24	5	13	40		12
Texas	6					1		4		
Utah	253	19	71	7	75	36	48	49	3	14
Vermont	3									
Virginia	14	6	5	9	10	2		5		3
Wyoming	1				1					
Total, 1913	**5,454**	**2,264**	**3,224**	**244**	**3,016**	**721**	**973**	**1,281**	**53**	**400**
Total, 1912	5,882	2,873	2,543	246	2,732	740	928	1,410	32	420
Total, 1911	6,042	(b)	1,796	242	2,924	747	876	1,207	30	576

[a] Does not include placer mines.

[b] Included in "Other causes."

neous mineral *mines (except coal mines) in the United States (by States) during the 1913, by causes.*

Underground—Continued.						Shaft.						
By mine fires.	By suffocation from natural gases.	By inrush of water.	By stepping on nail.	By other causes.	**Total, underground.**	By falling down shafts.	By objects falling down shafts.	By breaking of cable.	By overwinding.	By skip or cage.	By other causes.	**Total, shaft.**
11	**12**	**13**	**14**	**15**		**16**	**17**	**18**	**19**	**20**	**21**	
3	5	......	87	538	**3,955**	5	10	......	......	13	5	**33**
......	2	1	4	105	**454**	2	3	......	1	11	4	**21**
......	......	......	......	10	**128**	3	2	1	......	3	4	**13**
......	......	......	10	101	**602**	3	6	......	......	4	3	**16**
......	4	3	53	558	**4,396**	26	57	4	1	50	26	**164**
1	......	4	55	230	**2,734**	7	19	2	......	10	13	**51**
1	......	......	14	134	**788**	4	21	......	......	9	13	**47**
......	......	......	22	287	**2,237**	3	47	......	......	11	11	**72**
......	2	......	12	29	**674**	1	7	1	......	3	3	**15**
......	......	......	2	12	**274**	2	1	......	1	1	......	**5**
......	......	......	1	30	**339**	......	4	......	2	6	5	**17**
......	......	......	......	......	**15**	......	......	......	......	......	......	......
......	......	......	1	112	**443**	......	1	......	......	......	2	**3**
......	......	......	......	2	**17**	......	......	......	......	......	......	......
......	......	......	17	276	**931**	......	6	......	......	3	2	**11**
......	......	......	8	71	**1,404**	......	......	......	......	......	......	......
......	......	......	......	1	**8**	......	......	......	......	......	......	......
......	......	......	......	......	**1**	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	2	**2**	......	......	......	......	......	......	......
......	......	......	......	......	**9**	......	......	......	......	......	......	......
......	......	......	......	1	**11**	1	......	......	......	......	......	**1**
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	8	**41**	......	1	......	......	......	......	**1**
......	......	......	2	......	**21**	1	1	......	......	......	2	**4**
......	......	......	......	1	**7**	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	**1**	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	2	......	**22**	1	......	......	......	......	2	**3**
......	......	......	......	2	**9**	......	......	......	......	2	......	**2**
......	......	......	......	1	**27**	......	......	......	......	1	......	**1**
......	......	......	1	8	**92**	......	2	......	......	2	......	**4**
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	......	......	......	......	......	......	......	......	......
......	......	......	......	6	**185**	1	11	......	......	2	......	**14**
......	......	......	1	......	**12**	......	......	......	......	......	......	......
1	5	......	5	60	**646**	......	1	......	......	8	......	**9**
......	......	......	2	......	**5**	......	......	......	......	......	......	......
......	......	......	1	......	**55**	......	1	......	......	......	2	**3**
......	......	......	......	......	**2**	......	......	......	......	......	......	......
6	**18**	**8**	**300**	**2,585**	**20,547**	**60**	**201**	**8**	**5**	**139**	**97**	**510**
11	30	7	232	2,723	**20,809**	69	228	3	5	174	125	**604**
24	17	14	(b)	3,147	**17,642**	51	216	5	14	(b)	187	**473**

TABLE 12.—*Number of men* **slightly injured** *in and about all* **metal** *and* **miscella-**
calendar year 1913,

State.	Surface.									
	By mine cars and mine locomotives.	By railway cars and locomotives.	By run or fall of ore in or from ore bins.	By falls of persons.	By stepping on nail.	By hand tools, axes, bars, etc.	By electricity.	By machinery.	By other causes.	**Total, surface.**
	22	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	
Class A.										
Arizona	28	4	6	17	13	42	.....	35	107	**252**
California	3	1	2	5	3	5	.....	14	15	**48**
Colorado	6	.....	.....	3	.....	.....	.....	2	5	**16**
Idaho	2	.....	.....	6	.....	5	.....	9	24	**46**
Michigan	22	15	15	73	33	157	4	82	216	**617**
Minnesota	10	7	3	66	22	138	1	32	197	**476**
Missouri	1	52	2	19	20	20	.....	31	52	**197**
Montana	20	.....	5	13	3	65	1	14	56	**177**
Nevada	4	2	3	13	4	16	3	17	12	**74**
New Jersey	.....	3	.....	1	1	3	.....	4	10	**22**
New York	1	.....	2	.....	.....	2	4	.....	1	**10**
Oregon	.....	.....	.....	.....	.....	2	.....	1	.....	**3**
South Dakota	9	.....	.....	1	1	1	.....	2	8	**22**
Washington	.....	.....	.....	3	.....	1	.....	.....	3	**7**
Wisconsin	3	1	1	15	9	27	2	9	33	**100**
Class B.										
Alabama	2	7	3	38	3	74	1	20	6	**154**
Alaska[a]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Arkansas	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Connecticut	.....	.....	.....	.....	.....	1	.....	.....	.....	**1**
Florida	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Georgia	.....	.....	.....	.....	.....	1	.....	.....	.....	**1**
Illinois	.....	.....	.....	.....	.....	.....	.....	1	.....	**1**
Indiana, Louisiana, and West Virginia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iowa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kansas	.....	.....	.....	.....	1	.....	.....	2	2	**5**
Kentucky	.....	.....	.....	.....	.....	.....	.....	.....	5	**5**
Maine	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maryland	.....	.....	.....	.....	.....	.....	.....	.....	1	**1**
Massachusetts	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Hampshire	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Mexico	.....	.....	.....	.....	.....	.....	.....	.....	1	**1**
North Carolina	1	.....	.....	.....	1	3	.....	1	1	**7**
Ohio	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oklahoma	.....	.....	.....	1	2	4	.....	2	14	**23**
Pennsylvania	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Carolina	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tennessee	15	5	3	9	2	17	.....	8	6	**65**
Texas	.....	.....	.....	.....	.....	.....	.....	1	.....	**1**
Utah	.....	.....	3	2	.....	11	.....	19	4	**39**
Vermont	.....	.....	1	.....	.....	.....	.....	.....	.....	**1**
Virginia	1	.....	.....	.....	3	1	.....	5	.....	**10**
Wyoming	.....	.....	.....	.....	.....	1	.....	.....	.....	**1**
Total, 1913	**128**	**97**	**49**	**285**	**121**	**597**	**16**	**311**	**779**	**2,383**
Total, 1912	138	52	101	306	117	499	25	369	603	**2,210**
Total, 1911	135	42	100	(b)	(b)	(b)	22	289	1,048	**1,636**

[a] Does not include placer mines.

[b] Included in "Other causes."

neous mineral *mines (except coal mines) in the United States (by States) during the by causes*—Continued.

Surface (where surface mining is done).												Grand total.		
By falls or slides of rock or ore.	By explosives.	By haulage accidents.	By steam shovels.	By falls of persons.	By falls of derricks, booms, etc.	By run or fall of ore in or from ore bins.	By machinery (other than locomotives or steam shovels).	By electricity.	By hand tools.	By other causes.	Total, surface (where surface mining is done).	1913	1912	1911
31	32	33	34	35	36	37	38	39	40	41				
7	5	8	......	1	1	......	......	......	......	7	29	4,269	3,670	2,314
15	3	1	21	15	......	......	1	1	21	35	113	636	698	401
......	......	......	......	......	......	......	2	......	......	......	2	159	688	610
2	......	......	......	......	......	......	......	......	1	......	3	667	659	575
2	......	......	......	......	......	......	3	......	......	1	6	5,183	6,851	6,084
238	59	161	154	101	13	18	54	2	254	473	1,527	4,788	3,567	5,059
6	1	1	1	1	......	......	1	......	2	8	21	1,053	1,586	1,100
......	......	......	......	......	......	......	1	......	......	......	1	2,487	1,998	1,075
34	7	8	22	17	......	......	12	......	45	1	146	909	662	298
3	......	1	......	......	......	......	......	......	2	......	6	307	520	389
1	1	......	......	......	......	......	......	......	1	......	3	369	330	274
1	......	......	......	1	......	......	1	......	1	......	4	22	25	15
......	......	......	......	......	......	......	......	......	......	......	......	468	151	665
......	......	......	......	......	......	......	......	......	1	......	1	25	20	14
1	......	......	......	......	......	1	......	......	......	1	3	1,045	537	278
7	4	12	10	5	9	1	1	......	20	1	70	1,628	1,761	1,284
......	3	5	......	4	......	2	......	3	......	......	17	25	*a* 64	......
2	......	2	......	1	......	......	......	2	......	1	8	9	10	9
2	......	......	......	......	......	......	......	......	......	......	2	3	......	1
14	2	20	1	19	3	......	31	3	26	85	204	206	192	124
3	......	1	......	1	......	......	1	......	......	......	6	16	29	13
......	......	......	......	......	......	......	......	......	......	......	......	13	24	20
33	......	2	......	23	......	......	7	......	8	68	141	141	219	1
......	......	......	......	1	......	......	......	......	......	......	1	43	17	18
......	......	1	......	......	......	......	......	......	......	......	1	31	27	69
......	......	1	......	......	1	......	......	......	......	......	2	14	9	13
......	......	......	......	......	......	......	......	......	......	1	1	1	......	......
......	......	......	......	......	......	......	......	......	1	......	1	2	1	7
......	......	......	......	......	......	......	......	......	......	......	......	1	1	......
......	......	......	......	......	......	......	......	......	......	1	1	1	5	1
35	5	45	16	18	......	......	12	......	12	91	234	260	154	63
......	......	3	......	......	......	......	......	......	......	......	3	21	50	21
......	......	......	......	......	......	......	......	......	......	......	......	28	20	32
3	......	......	......	......	......	......	1	......	......	......	4	123	48	5
3	......	......	......	......	......	......	2	......	......	1	6	6	2	5
1	10	1	......	2	......	2	......	......	......	......	16	16	26	1
3	3	19	1	2	1	1	3	......	5	24	62	326	315	226
......	......	......	......	......	......	......	......	......	......	......	......	13	3	......
254	57	43	13	125	......	......	17	3	51	392	955	1,649	1,184	1,245
......	......	......	......	......	......	......	......	......	......	......	......	6	6	1
11	4	9	......	......	......	......	6	......	......	10	40	108	100	94
......	......	......	......	......	1	......	......	......	......	......	1	4	3	4
681	**164**	**344**	239	337	29	**25**	156	**14**	**451**	1,201	**3,641**	**27,081**	......	......
433	120	301	238	285	35	8	147	7	330	705	2,609	......	26,232	......
426	109	377	180	297	69	9	301	9	(*b*)	880	2,657	......	......	22,408

TABLE 13.—*Number of men seriously and slightly injured per 1,000 employed in and United States (by States)*

State.	Number seriously injured.					
	Under-ground.[a]	Per 1,000 employed.	On the surface.	Per 1,000 employed.	**Total.**	**Per 1,000 employed.**
Class A.						
Arizona	724	55.56	83	24.00	**807**	**48.94**
California	133	17.88	73	18.07	**206**	**17.95**
Colorado [b]	83	5.77	12	7.66	**95**	**5.96**
Idaho	70	17.09	12	7.17	**82**	**14.21**
Michigan	1,157	59.24	181	20.94	**1,338**	**47.49**
Minnesota	930	104.06	642	60.51	**1,572**	**80.43**
Missouri	44	6.24	13	4.83	**57**	**5.85**
Montana	404	26.59	45	10.45	**449**	**23.03**
Nevada	128	25.87	56	23.65	**184**	**25.15**
New Jersey	34	31.72	8	22.16	**42**	**29.31**
New York[c]	110	49.17	13	11.73	**123**	**36.77**
Oregon	5	7.05	1	1.56	**6**	**4.45**
South Dakota	21	7.57	2	1.77	**23**	**5.89**
Washington	14	16.61	2	4.36	**16**	**12.29**
Wisconsin	170	52.04	21	19.76	**191**	**44.11**
Class B.						
Alabama	254	79.80	14	7.52	**268**	**51.42**
Alaska [d]	2	.34	2	.96	**4**	**.50**
Arkansas	1	35.71	1	3.24	**2**	**5.93**
Connecticut	1	6.80	....	....	**1**	**3.92**
Florida	1	55.56	54	11.95	**55**	**12.12**
Georgia	....	....	2	6.39	**2**	**4.50**
Illinois	2	6.31	3	15.46	**5**	**9.78**
Indiana, Louisiana, Rhode Island, and West Virginia.	....	....	14	28.57	**14**	**28.57**
Iowa	3	13.95	....	....	**3**	**12.99**
Kansas	2	4.55	....	....	**2**	**3.29**
Kentucky	....	....	....	....	....	....
Maine	....	....	....	....	....	....
Maryland	....	....	1	2.90	**1**	**2.79**
Massachusetts	2	58.82	....	....	**2**	**41.67**
New Hampshire	1	55.56	....	....	**1**	**12.05**
New Mexico	7	3.47	28	15.99	**35**	**9.29**
North Carolina	9	11.90	8	19.46	**17**	**14.57**
Ohio	3	10.71	....	....	**3**	**9.84**
Oklahoma	4	10.87	2	7.33	**6**	**9.36**
Pennsylvania	....	....	2	3.67	**2**	**3.05**
South Carolina	....	....	....	....	....	....
Tennessee	27	21.18	18	9.59	**45**	**14.28**
Texas	1	4.15	....	....	**1**	**2.86**
Utah	110	22.92	96	31.24	**206**	**26.17**
Vermont	1	13.16	1	14.93	**2**	**13.99**
Virginia	10	8.86	9	6.13	**19**	**7.32**
Wyoming	....	....	3	8.31	**3**	**4.87**
Total, 1913	**4,468**	**34.99**	**1,422**	**21.75**	**5,890**	30.50
Total, 1912	3,447	31.32	1,055	17.84	**4,502**	26.61
Total, 1911	3,263	31.19	906	14.77	**4,169**	25.12

---

[a] Includes those killed in shaft accidents.

[b] Reported by T. R. Henahen, commissioner of mines, Denver, Colo.

about all ***metal*** *and* ***miscellaneous mineral*** *mines (except coal mines) in the during the calendar year 1913.*

Number slightly injured.						Character of accidents that must be reported according to State law.
Underground.[a]	Per 1,000 employed.	On the surface.	Per 1,000 employed.	**Total.**	**Per 1,000 employed.**	
3,988	306.04	281	81.26	**4,269**	**258.90**	Fatal or serious. Acts of 1912, ch. 33.
475	63.87	161	39.86	**636**	**55.42**	Fatal and more than one week. Acts of 1911.
141	9.80	18	11.49	**159**	**9.97**	Fatal and two consecutive days. Rev. Stats., 1908, sec. 4303.
618	150.88	49	29.29	**667**	**115.62**	Fatal or serious. Rev. Code, 1909, sec. 207.
4,560	233.47	623	72.08	**5,183**	**183.96**	Fatal or serious. Act of Apr. 25, 1911, sec. 8.
2,785	311.63	2,003	188.80	**4,788**	**244.96**	Fatal or serious. Gen. Stats., 1913, par. 3921.
835	118.39	218	80.92	**1,053**	**108.03**	Fatal or serious. Rev. Stats., 1909, sec. 84.
2,309	151.99	178	41.32	**2,487**	**127.54**	Fatal or serious at mines employing 5 or more men. Code 1907, secs. 1717 and 1720.
689	139.25	220	92.91	**909**	**124.25**	Fatal or serious at mines employing wage earners. Laws of 1912.
279	260.26	28	77.53	**307**	**214.24**	Fatal and two weeks. Acts of 1911, ch. 5; act of Mar. 24, 1904, and Apr. 17, 1914.
356	159.14	13	11.73	**369**	**110.31**	All fatal and nonfatal. Laws of 1910, ch. 15.
15	21.16	7	10.94	**22**	**16.31**	Fatal and serious injuries, causing employees to cease work. Act of Feb. 18, 1911.
446	160.77	22	19.49	**468**	**119.91**	Fatal or serious, at all mines not worked exclusively by owner or lessee. Grantham's Annotated S. Dak. Stats., 1901, secs. 132, 133, and 138.
17	20.17	8	17.43	**25**	**19.20**	"Any accident." Laws of 1911, sec. 14.
942	288.34	103	96.90	**1,045**	**241.34**	All "causing death or disability." Laws of 1911, sec. 2394, par. 35.
1,404	418.98	224	120.37	**1,628**	**312.36**	
8	1.35	17	8.19	**25**	**3.13**	Fatal or serious, at mines employing 6 or more men. Act of Apr. 30, 1913, effective Apr. 1, 1914.
1	35.71	8	25.89	**9**	**26.71**	
....	....	3	27.78	**3**	**11.76**	
2	111.11	204	45.13	**206**	**45.39**	
9	68.70	7	22.36	**16**	**36.04**	
12	37.85	1	5.15	**13**	**25.44**	Fatal or 30 days. Acts of 1907, sec. 1, p. 308.
....	....	141	287.76	**141**	**287.76**	
42	195.35	1	62.50	**43**	**186.15**	
25	56.82	6	35.71	**31**	**50.99**	
7	30.70	7	24.31	**14**	**27.13**	
....	....	1	8.26	**1**	**8.26**	
....	....	2	5.80	**2**	**5.57**	
1	29.41	....	....	**1**	**20.83**	
....	....	1	15.38	**1**	**12.05**	
25	12.41	235	134.21	**260**	**69.04**	
11	14.54	10	24.33	**21**	**17.99**	
28	100.00	....	....	**28**	**91.80**	
96	260.87	27	98.90	**123**	**191.89**	
....	....	6	11.01	**6**	**9.15**	Fatal and 2 days. Act of July 19, 1913.
....	....	16	37.91	**16**	**36.04**	
199	156.08	127	67.70	**326**	**103.46**	
12	49.79	1	9.17	**13**	**37.14**	
655	136.49	994	323.47	**1,649**	**209.48**	
5	65.79	1	14.93	**6**	**41.96**	
58	51.37	50	34.08	**108**	**41.60**	
2	7.84	2	5.54	**4**	**6.49**	
21,057	**164.89**	**6,024**	**92.13**	27,081	140.25	
21,413	194.56	4,819	81.48	26,232	155.04	
18,115	173.15	4,293	69.97	22,408	135.01	

---

[c] Reported by W. W. Jones, State mine inspector, Albany, N. Y.
[d] Reported by S. S. Smith, United States mine inspector, Juneau, Alaska.

TABLE 14.—*Number of mine operators reporting less than 1,000 days' work performed, and number of those reporting 1,000 or more days' work performed during the calendar year 1913.*

State.	Less than 1,000 days' work done.						1,000 or more days' work done.						Grand total.	
	Copper.	Iron.	Lead and zinc.	Gold and miscellaneous metal.	Nonmetal.	**Total.**	Copper.	Iron.	Lead and zinc.	Gold and miscellaneous metal.	Nonmetal.	**Total.**	**1913.**	1912.
Alabama					2	**2**		17		3	2	**22**	**24**	20
Alaska	4			(*a*)		**4**	9			337		**346**	**350**	*b* 30
Arizona	88	1		165	1	**255**	94			74	3	**171**	**426**	479
Arkansas			4			**4**			2	2		**4**	**8**	11
California	26	1		694	14	**735**	17			296	6	**319**	**1,054**	1,048
Colorado *c*	(*a*)	(*a*)		200	(*a*)	**200**	(*a*)			813	(*a*)	**813**	**1,013**	624
Connecticut								1			4	**5**	**5**	5
Florida					1	**1**					26	**26**	**27**	24
Georgia		1		2	1	**4**		1		6	10	**17**	**21**	29
Idaho	45	1		407	3	**456**	12	1		115	4	**132**	**588**	639
Illinois									12			**12**	**12**	8
Iowa			3		1	**4**					5	**5**	**9**	12
Kansas			11			**11**			26		3	**29**	**40**	50
Kentucky								1	10		4	**15**	**15**	14
Maine					2	**2**					3	**3**	**5**	4
Maryland					3	**3**	1	2			10	**13**	**16**	19
Massachusetts					1	**1**		1			1	**2**	**3**	4
Michigan		1				**1**	37	41			5	**83**	**84**	79
Minnesota								54				**54**	**54**	43
Missouri		3	56		9	**68**		5	208		2	**215**	**283**	318
Montana	48			228	1	**277**	24	1		81	1	**107**	**384**	405
Nevada	41	2		283	4	**330**	30	1		204	1	**236**	**566**	554
New Hampshire					2	**2**					5	**5**	**7**	7
New Jersey								5		1	1	**7**	**7**	10
New Mexico	17	1		56	2	**76**	14	2		41	6	**63**	**139**	163
New York *c*								10		3	23	**36**	**36**	39
North Carolina				6	25	**31**	1	1		7	20	**29**	**60**	70
Ohio		1				**1**		2			4	**6**	**7**	7
Oklahoma			3			**3**			23	1	9	**33**	**36**	30
Oregon	22			194	1	**217**	2			41	1	**44**	**261**	260
Pennsylvania	1				10	**11**		11			12	**23**	**34**	38
South Carolina				1	1	**2**				1	3	**4**	**6**	7
South Dakota	3			44	1	**48**	1			23	2	**26**	**74**	63
Tennessee					2	**2**	2	14		2	16	**34**	**36**	36
Texas										3	5	**8**	**8**	8
Utah	34	4		133	2	**173**	31	1		73	7	**112**	**285**	336
Vermont					3	**3**	1				6	**7**	**10**	11
Virginia	1				4	**5**		7		7	9	**23**	**28**	33
Washington	50	2		137	2	**191**	19			21		**40**	**231**	277
Wisconsin			16	1		**17**		7	35		2	**44**	**61**	77
Wyoming	15			37	6	**58**	4	1		6	2	**13**	**71**	74
Other States *d*					1	**1**		1			1	**2**	**3**	2
Total, 1913	**395**	**18**	**93**	**2,588**	**105**	**3,199**	**299**	**188**	**316**	**2,161**	**224**	**3,188**	**6,387**	
Total, 1912	455	20	137	2,848	126	**3,586**	359	174	327	1,289	232	**2,381**		5,967

a Not segregated.

b Placer mines not included.

c Total number of operators reported by inspector.

d Includes Indiana, Louisiana, Rhode Island, and West Virginia.

TABLE 15.—*Percentages of deaths in and about all* ***metal*** *and* ***miscellaneous mineral*** *mines (except coal mines) in the United States resulting from various causes during the calendar years 1913, 1912, and 1911.*

Cause of death.	Killed.							
	Copper mines.	Gold and miscellaneous metal mines.	Iron mines.	Lead and zinc mines (Mississippi Valley).	Miscellaneous mineral mines.	**Average for all mines, 1913.**	Average for all mines, 1912.	Average for all mines, 1911.
	Per cent	*Per cent.*	*Per cent*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Fall of rock or ore from roof or wall	32.20	32.38	31.52	38.10	26.67	**32.21**	32.10	27.48
Rock or ore while loading at working face	.84	.48	4.24	....	....	**1.46**	.30	(a)
Timber or hand tools	.43	1.43	1.82	2.38	....	**1.17**	.90	1.44
Explosives	9.74	16.67	6.67	16.67	3.33	**11.28**	11.04	8.92
Haulage accidents	8.47	.95	7.27	2.38	....	**5.13**	5.29	2.88
Fall down chute, winze, raise, or stope	10.59	10.00	2.42	2.38	3.33	**7.62**	6.50	6.76
Run of ore from chute or pocket	2.55	.95	1.21	....	....	1.46	1.51	2.01
Drilling accidents	....	....	....	....	....	....	.30	....
Electricity	2.55	2.38	2.42	2.38	....	**2.34**	2.87	2.16
Machinery (not including locomotives or drills)	....	1.90	....	....	....	**.58**	.30	1.44
Mine fires	....	....	....	....	....	....	.15	5.32
Suffocation from natural gases	....	1.43	....	....	....	**.44**	.61	1.15
Inrush of water	....	....	....	....	....	....	.76	1.73
Stepping on nail	....	....	....	....	....	....	....	(a)
Other causes	5.09	2.85	1.82	2.38	3.33	**3.37**	1.21	1.44
Total killed underground	**72.46**	**71.42**	**59.39**	**66.67**	**36.67**	**67.06**	**63.84**	**62.73**
Falling down shafts	3.81	4.77	3.64	2.38	....	**3.81**	6.05	8.20
Objects falling down shaft	2.96	2.38	1.21	2.38	....	2.20	1.82	2.59
Breaking of cables	....	....	1.21	....	....	.29	.30	.58
Overwinding	.43	....	.61	2.38	....	.44	....	....
Skip or cage	3.81	6.19	6.67	2.38	....	**4.98**	5.60	....
Other causes	2.55	.95	1.21	....	....	**1.46**	1.36	3.88
Total killed in shaft	**13.56**	**14.29**	**14.55**	**9.52**	....	**13.18**	**15.13**	**15.25**
Mine cars or mine locomotives	.43	.95	2.42	4.76	....	**1.32**	.91	.58
Railway cars or locomotives	.84	.48	....	2.38	....	**.58**	.76	1.15
Run or fall of ore in or from ore bins	....	....	1.21	....	....	.29	.30	.43
Falls of persons	....	.95	1.82	....	....	.73	.91	(a)
Stepping on nail	....	.48	....	....	....	.15	....	(a)
Hand tools, axes, bars, etc.	....	....	....	....	....	....	....	(a)
Electricity	.84	.48	.61	2.38	....	.73	.76	.29
Machinery	1.27	2.38	.61	4.76	....	**1.61**	1.66	1.15
Other causes	.43	2.85	2.42	....	3.33	**1.76**	3.63	6.04
Total killed on surface	**3.81**	**8.57**	**9.09**	**14.29**	**3.33**	**7.17**	**8.93**	**9.64**
Falls or slides of rock or ore	1.69	.48	4.84	2.38	10.00	**2.49**	2.42	5.04
Explosives	2.55	.95	1.82	2.38	....	**1.76**	3.17	2.31
Haulage accidents	5.09	.48	6.67	....	20.00	**4.39**	3.03	3.02
Steam shovels	....	....	1.21	....	....	.29	.61	.14
Falls of persons	....	....	.61	....	....	.15	.45	.43
Falls of derricks, booms, etc	....	.48	....	....	....	**.15**	.30	.14
Run or fall of ore in or from ore bins	....	....	....	....	....	....	....	....
Machinery (other than locomotives or steam shovels)	.84	1.43	1.21	2.38	6.67	**1.46**	.91	.43
Electricity	....	.95	.61	....	6.67	.73	.15	....
Hand tools	....	....	....	....	....	....	....	(a)
Other causes	....	.95	....	2.38	16.66	**1.17**	1.06	.87
Total killed by surface accidents (where surface mining is done)	**10.17**	**5.72**	**16.97**	**9.52**	**60.00**	**12.59**	**12.10**	**12.38**
	100.00	100.00	100.00	100.00	100.00	**100.00**	100.00	100.00

a Included in "Other causes."

TABLE 16.—*Percentages of injuries in and about all* ***metal*** *and* ***miscellaneous min-***
the calendar years

Causes of injury.	Seriously injured.				
	Copper mines.	Gold and miscellaneous metal mines.	Iron mines.	Lead and zinc mines (Mississippi Valley).	Miscellaneous mineral mines.
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Fall of rock or ore from roof or wall	23.51	24.05	20.04	16.48	7.90
Rock or ore while loading at working face	7.11	3.80	4.40	12.08	3.28
Timber or hand tools	8.97	6.96	11.52	4.40	.66
Explosives	2.10	4.90	1.70	4.40	1.98
Haulage accidents	15.49	8.23	14.01	19.78	8.55
Fall down chute, winze, raise, or stope	4.83	6.96	2.52	4.40	.66
Run of ore from chute or pocket	2.28	3.16	2.66	....	....
Drilling accidents	3.92	5.54	3.19	3.29	3.28
Electricity	.04	.32	.14	....	....
Machinery (not including locomotives or drills)	.86	2.69	1.67	2.20	.66
Mine fires	.23	.16	....	....	....
Suffocation from natural gases	....	.16	.07	....	....
Inrush of water	....	....	.32	....	....
Stepping on nail	.09	.16	.53	....	....
Other causes	10.11	6.80	5.35	6.59	1.98
Total injured underground	**79.54**	**73.89**	**68.12**	**73.62**	**28.95**
Falling down shafts	.55	1.11	.64	....	1.98
Objects falling down shafts	.82	1.11	.78	1.10	....
Breaking of cables	....	....	.03	....	....
Overwinding	.14	....	....	....	....
Skip or cage	1.18	2.85	1.21	2.20	....
Other causes	1.27	1.42	.46	1.10	....
Total injured in shaft	**3.96**	**6.49**	**3.12**	**4.40**	**1.98**
Mine cars or mine locomotives	.68	.95	.50	....	1.98
Railway cars or locomotives	.46	....	.67	3.29	....
Run or fall of ore in or from ore bins	.18	.16	....	....	....
Falls of persons	1.32	.63	1.88	3.29	1.31
Stepping on nail	.09	.16	.11	....	....
Hand tools, axes, bars, etc	1.10	.63	1.77	3.29	1.31
Electricity	.18	.16	.03	....	....
Machinery	1.64	3.48	1.49	5.50	1.31
Other causes	3.83	2.37	3.37	4.40	.66
Total injured on surface	**9.48**	**8.54**	**9.82**	**19.78**	**6.57**
Falls or slides of rock or ore	1.69	.63	3.62	1.10	11.18
Explosives	.73	.32	.78	1.10	5.26
Haulage accidents	1.09	.63	2.94	....	9.87
Steam shovels	.73	2.22	2.80	....	1.98
Falls of persons	.82	1.58	1.00	....	7.23
Falls of derricks, booms, etc	....	.47	.28	....	....
Run or fall of ore in or from bins	....	.16	.11	....	.66
Machinery (other than locomotives or steam shovels)	.50	.16	.21	....	8.55
Electricity	....	....	....	....	1.98
Hand tools	.23	1.27	2.63	....	4.61
Other causes	1.23	3.64	3.97	....	11.18
Total injured by surface accidents (where surface mining is done)	**7.02**	**11.08**	**18.94**	**2.20**	**62.50**
	100.00	100.00	100.00	100.00	100.00

***eral** mines (except coal mines) in the United States resulting from various causes during 1913, 1912, and 1911.*

Seriously injured—Continued.			Slightly injured.							
Average for all mines, 1913.	Average for all mines, 1912.	Average for all mines, 1911.	Copper mines.	Gold and miscellaneous metal mines.	Iron mines.	Lead and zinc mines (Mississippi Valley).	Miscellaneous mineral mines.	**Average for all mines, 1913.**	Average for all mines, 1912.	Average for all mines, 1911.
Per cent.	*Per cent.*	*Per cent.*	*P. ct.*	*P. ct.*	*P. ct.*	*Per cent.*	*Per cent.*	*Per cent.*	*P. ct.*	*P. ct.*
21.39	24.48	29.12	24.17	20.30	17.68	14.20	3.76	**20.14**	22.42	26.96
5.43	5.80	(*a*)	7.68	7.35	7.92	20.37	7.37	**8.36**	10.95	(*a*)
9.69	6.95	6.41	12.46	9.81	13.41	5.43	2.02	**11.90**	9.70	8.02
2.24	3.40	3.33	.70	.93	1.00	1.34	1.73	**.90**	.94	1.08
13.89	12.86	14.54	10.38	10.98	12.53	8.62	7.52	**11.14**	10.41	13.05
3.84	4.46	3.86	4.02	4.31	1.23	.15	....	**2.66**	2.82	3.33
2.46	2.51	2.52	3.84	8.28	2.57	.22	....	**3.59**	3.54	3.91
3.72	4.51	4.56	3.80	8.16	4.38	8.11	2.46	**4.73**	5.38	5.39
.12	.16	.07	.10	.19	.31	....	.29	**.19**	.12	.13
1.46	1.13	2.54	1.04	1.58	1.69	3.42	1.15	**1.48**	1.60	2.57
.10	.02	....	.04	....	.01	.07	....	**.02**	.04	.11
.05	.11	.02	.05	.28	.04	....	....	**.07**	.11	.08
.15	.07	....	.03	.03	.04	....	....	**.03**	.03	.06
.31	.20	(*a*)	1.06	1.09	1.19	1.27	.43	**1.11**	.89	(*a*)
7.22	5.97	7.63	10.49	11.45	8.11	11.97	2.75	**9.55**	10.38	14.04
72.07	**72.63**	**74.60**	**79.86**	**84.74**	**72.11**	**75.17**	**29.48**	**75.87**	**79.33**	**78.73**
.68	.78	1.01	.20	.34	.19	.45	....	**.22**	.26	.23
.81	1.11	.96	.73	.87	.59	1.86	.58	**.74**	.87	.96
.02	.07	.05	.02	.06	.04	....	....	**.03**	.01	.02
.05	....	.29	....	.06	.03	....	....	**.02**	.02	.06
1.36	1.57	(*a*)	.43	.74	.49	.89	.29	**.51**	.66	(*a*)
.87	.40	1.36	.29	.59	.28	1.19	....	**.36**	.48	.84
3.79	**3.93**	**3.67**	**1.67**	**2.66**	**1.62**	**4.39**	**.87**	**1.88**	**2.30**	**2.11**
.65	.71	1.20	.53	.87	.30	.15	1.01	**.47**	.53	.06
.54	.60	.36	.15	.09	.24	3.87	....	**.36**	.20	.19
.08	.42	.38	.23	.22	.11	.15	.29	**.18**	.38	.44
1.55	1.93	(*a*)	.52	.90	1.58	1.86	.72	**1.05**	1.17	(*a*)
.10	.14	(*a*)	.20	.31	.58	1.86	.14	**.45**	.44	(*a*)
1.41	1.40	(*a*)	1.41	1.49	3.36	2.15	.72	**2.20**	1.90	(*a*)
.10	.09	.02	.04	.09	.08	....	....	**.06**	.09	.10
1.82	2.31	2.21	.78	1.74	1.15	2.97	.87	**1.15**	1.41	1.29
3.38	2.73	4.37	2.37	2.14	3.40	5.72	.87	**2.88**	2.30	4.68
9.63	**10.33**	**8.54**	**6.23**	**7.85**	**10.80**	**18.73**	**4.62**	**8.80**	**8.42**	**7.30**
2.73	2.75	2.25	2.90	.84	2.43	.53	9.25	**2.51**	1.65	1.90
.83	1.20	.98	.69	.12	.64	.07	.58	**.57**	.46	.49
2.14	1.71	2.95	.98	.19	1.70	.07	7.95	**1.30**	1.15	1.68
1.90	1.55	1.54	.45	.65	1.55	.07	.29	**.89**	.91	.80
1.43	1.02	1.20	1.46	.53	.99	.07	6.94	**1.24**	1.08	1.33
.19	.29	.24	.01	....	.21	....	1.15	**.11**	.13	.31
.08	.02	.10	.03	....	.18	.07	....	**.09**	.03	.04
.53	.56	1.10	.34	.25	.60	.07	6.79	**.58**	.56	1.34
.05	.14	.07	.03	.09	.02	....	.43	**.04**	.03	.04
1.59	1.00	(*a*)	.96	.93	2.59	.15	5.64	**1.68**	1.26	(*a*)
3.04	2.87	2.76	4.39	1.15	4.56	.60	26.01	**4.44**	2.69	3.93
14.51	**13.11**	**13.19**	**12.24**	**4.75**	**15.47**	**1.71**	**65.03**	**13.45**	**9.95**	**11.86**
100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

a Included in "Other causes."

TABLE 17.—*Number of men killed or injured per 1,000 employed in and about all* **metal** *and* **miscellaneous mineral** *mines (except coal mines) in the United States, based on the actual average number of days worked, compared with similar data based on a year of 300 working days.*[a]

State.	Average days worked, 1913.	Number of fatalities.		Number of serious injuries.		Number of slight injuries.	
		As reported.	**On 300-day basis.**	As reported.	**On 300-day basis.**	As reported.	**On 300-day basis.**
Alabama	285	4.22	**4.44**	51.42	**54.13**	312.36	**328.82**
Alaska [b]	263	3.13	**3.58**	.50	**.57**	3.13	**3.58**
Arizona	315	5.22	**4.97**	48.94	**46.61**	258.90	**246.56**
Arkansas	258	....	....	5.93	**6.90**	26.71	**31.03**
California	271	4.53	**5.01**	17.95	**19.83**	55.42	**61.24**
Colorado	299	2.76	**2.77**	5.96	**5.98**	9.97	**10.01**
Connecticut	290	....	....	3.92	**4.05**	11.76	**12.15**
Florida	253	3.09	**3.65**	12.12	**14.35**	45.39	**53.73**
Georgia	229	2.25	**2.94**	4.50	**5.88**	36.04	**47.06**
Idaho	283	4.16	**4.41**	14.21	**15.05**	115.62	**122.43**
Illinois	266	1.96	**2.21**	9.78	**11.06**	25.44	**28.76**
Iowa	264	....	....	12.99	**14.78**	186.15	**211.82**
Kansas	242	6.58	**8.16**	3.29	**4.08**	50.99	**63.27**
Kentucky	183	....	....	....	....	27.13	**44.44**
Maine	266	....	....	....	....	8.26	**9.35**
Maryland	290	....	....	2.79	**2.88**	5.57	**5.76**
Massachusetts	292	....	....	41.67	**42.55**	20.83	**21.28**
Michigan	280	2.91	**3.12**	47.49	**50.95**	183.96	**197.35**
Minnesota	306	3.22	**3.16**	80.43	**78.91**	244.96	**240.34**
Missouri	252	3.49	**4.16**	5.85	**6.97**	108.03	**128.70**
Montana	317	3.28	**3.11**	23.03	**21.80**	127.54	**120.78**
Nevada	307	3.42	**3.34**	25.15	**24.61**	124.25	**121.59**
New Hampshire	193	....	....	12.05	**18.87**	12.05	**18.87**
New Jersey	310	5.58	**5.41**	29.31	**28.38**	214.24	**207.43**
New Mexico	243	7.43	**9.19**	9.29	**11.49**	69.04	**85.33**
New York	278	4.19	**4.51**	36.77	**39.65**	110.31	**118.96**
North Carolina	186	3.43	**5.26**	14.57	**22.34**	17.99	**27.60**
Ohio	281	....	....	9.84	**10.49**	91.80	**97.90**
Oklahoma	231	1.56	**2.02**	9.36	**12.15**	191.89	**248.99**
Oregon	194	2.22	**3.43**	4.45	**6.86**	16.31	**25.17**
Pennsylvania	261	....	....	3.05	**3.50**	9.15	**10.49**
South Carolina	318	....	....	....	....	36.04	**49.54**
South Dakota	185	2.05	**3.33**	5.89	**9.58**	119.91	**194.92**
Tennessee	263	3.17	**3.62**	14.28	**16.28**	103.46	**117.95**
Texas	291	2.86	**2.92**	2.86	**2.92**	37.14	**38.01**
Utah	323	4.59	**4.25**	26.17	**24.32**	209.48	**194.69**
Vermont	232	6.99	**9.01**	13.99	**18.02**	41.96	**54.05**
Virginia	274	4.62	**5.07**	7.32	**8.02**	41.60	**45.59**

Washington	200	3.07	**4.60**	12.29	**18.41**	19.20	**28.77**
Wisconsin	288	2.54	**2.65**	44.11	**46.00**	241.34	**251.69**
Wyoming	220	....	....	4.87	**6.65**	6.49	**8.87**
Other States	359	2.04	**1.71**	28.57	**23.89**	287.76	**240.61**
Total, 1913	**285**	**3.54**	**3.72**	**30.50**	**32.09**	**140.25**	**147.54**
Total, 1912	287	3.91	**4.09**	26.61	**27.85**	155.04	**162.26**
Total, 1911	282	4.19	**4.45**	25.12	**26.71**	135.01	**143.56**

---

a For details giving number killed, number employed, and days worked, see Table 5; for number injured, see Table 13.

b Serious and slight injuries not reported for Alaska placers, hence low injury ratio.

TABLE 18.—*Number of men employed, number of days worked, and number of men killed per 1,000 employed in and about all* **metal** *and* **miscellaneous mineral** *mines in the different States in the calendar year* **1912**.

State.	Number of active operators.	Number of employees.			Days' work done.	Average number of days worked.	Number killed.						Widows.	Orphans.
		Under-ground.	On the surface.	Total.			Under-ground.[a]	Per 1,000 em-ployed.	On the surface.	Per 1,000 em-ployed.	**Total.**	**Per 1,000 em-ployed.**		
Alabama	20	2,770	2,057	4,827	1,302,041	270	26	9.39	7	3.40	**33**	**6.84**	19	37
Alaska[b]	30	1,562	352	1,914	652,873	341	11	7.04	10	28.41	**21**	**10.97**	4	9
Arizona	479	11,575	4,016	15,591	4,701,702	302	63	5.44	4	1.00	**67**	**4.30**	23	42
Arkansas	11	379	25	404	103,735	257	0	....	1	40.00	**1**	**2.48**	1	2
California	1,048	6,167	4,145	10,312	2,845,815	276	27	4.38	13	3.14	**40**	**3.88**	14	24
Colorado	624	6,778	2,114	8,892	2,656,168	299	44	6.49	4	1.89	**48**	**5.40**	21	18
Connecticut	5	158	101	259	76,930	297	0	....	0	....	**0**	....	0	0
Florida	24	240	4,221	4,461	1,320,480	296	0	....	6	1.42	**6**	**1.34**	1	0
Georgia	29	231	284	515	112,081	218	0	....	0	....	**0**	....	0	0
Idaho	639	4,430	1,799	6,229	1,692,351	272	26	5.87	3	1.47	**29**	**4.66**	5	7
Illinois	8	326	114	440	132,658	301	1	3.07	0	....	**1**	**2.27**	0	0
Indiana, Louisiana, and West Virginia	2	....	591	591	214,065	362	0	....	0	....	**0**	....	0	0
Iowa	12	184	16	200	48,753	244	0	....	0	....	**0**	....	0	0
Kansas	50	613	218	831	194,238	234	2	3.26	0	....	**2**	**2.41**	2	0
Kentucky	14	106	354	460	85,873	187	1	9.43	0	....	**1**	**2.17**	0	0
Maine	4	....	72	72	16,230	225	0	....	0	....	**0**	....	0	0
Maryland	19	62	267	329	89,136	271	0	....	0	....	**0**	....	0	0
Massachusetts	4	46	12	58	15,100	260	0	....	0	....	**0**	....	0	0
Michigan	79	21,427	8,042	29,469	8,946,517	304	88	4.11	8	0.99	**96**	**3.26**	52	141
Minnesota	43	8,528	8,031	16,559	4,760,330	287	28	3.28	22	2.74	**50**	**3.02**	26	59
Missouri	318	8,531	2,872	11,403	3,046,934	267	32	3.75	4	1.39	**36**	**3.16**	18	52
Montana	405	10,403	2,937	13,340	3,979,041	298	44	4.23	6	2.04	**50**	**3.75**	15	20
Nevada	554	5,145	2,402	7,547	2,226,733	295	16	3.11	18	7.49	**34**	**4.51**	18	12
New Hampshire	7	17	73	90	16,804	187	1	58.82	0	....	**1**	**11.11**	0	0
New Jersey	10	1,266	367	1,633	460,997	282	11	8.69	2	5.45	**13**	**7.96**	7	14
New Mexico	163	1,289	1,213	2,502	669,707	268	10	7.76	3	2.47	**13**	**5.20**	4	6
New York[c]	39	1,923	787	2,710	789,982	292	16	8.32	1	1.27	**17**	**6.27**	(*d*)	(*d*)
North Carolina	70	729	339	1,068	215,194	201	1	1.37	0	....	**1**	**0.94**	0	0
Ohio	7	262	48	310	76,397	246	0	....	1	20.83	**1**	**3.23**	1	0
Oklahoma	30	315	226	541	113,041	209	1	3.17	1	4.42	**2**	**3.70**	2	6
Oregon	260	595	457	1,052	198,906	189	1	1.68	0	....	**1**	**0.95**	0	0
Pennsylvania	38	104	658	762	191,254	251	2	19.23	0	....	**2**	**2.62**	0	0
South Carolina	7	40	1,001	1,041	286,514	275	0	....	0	....	**0**	....	0	0
South Dakota	63	1,641	322	1,963	589,427	300	3	1.83	3	9.32	**6**	**3.06**	6	10
Tennessee	36	1,136	2,344	3,480	881,291	253	5	4.40	7	2.99	**12**	**3.45**	5	5
Texas	8	226	160	386	106,940	277	0	....	0	....	**0**	....	0	0
Utah	336	5,796	2,662	8,458	2,555,037	302	32	5.52	9	3.38	**41**	**4.85**	12	22

Vermont	11	90	91	181	45,325	250	2	22.22	0	....	2	11.05	0	0
Virginia	33	1,068	1,448	2,516	689,800	274	2	1.87	2	1.38	4	1.59	2	5
Washington	277	858	449	1,307	196,807	151	2	2.33	2	4.45	4	3.06	2	0
Wisconsin	77	2,772	1,062	3,834	1,039,400	271	20	7.22	2	1.88	22	5.74	11	28
Wyoming	74	268	394	662	155,903	236	4	14.93	0	....	4	6.04	2	1
Total, 1912	**5,967**	**110,056**	**59,143**	**169,199**	**48,498,510**	**287**	**522**	**4.74**	**139**	**2.35**	**661**	**3.91**	**273**	**520**
Total, 1911	5,232	104,623	61,356	165,979	46,826 573	282	542	5.18	153	2.49	695	4.19	297	600

[a] Includes those killed in shaft accidents.

[b] Placer mines not included. Snow slide killed 9 men.

[c] Fatalities and employees reported by W. W. Jones, State mine inspector, Albany, N. Y. Segregation of underground and surface employees estimated from returns for 1911.

[d] Not reported.

Original from PRINCETON UNIVERSITY

TABLE 19.—*Number of men seriously and slightly injured per 1,000 employed in and about States (by States) during*

State.	Number seriously injured.					
	Under-ground.[a]	Per 1,000 employed.	On the surface.	Per 1,000 employed.	**Total.**	**Per 1,000 employed.**
Class A.						
Arizona	467	40.35	82	20.42	549	35.21
California	129	20.92	38	9.17	167	16.19
Colorado	119	17.56	18	8.51	137	15.41
Idaho	51	11.51	10	5.56	61	9.79
Michigan	1,070	49.94	143	17.78	1,213	41.16
Minnesota	479	56.18	378	47.07	857	51.75
Missouri	84	9.85	18	6.27	102	8.95
Montana	193	18.55	31	10.55	224	16.79
Nevada	123	23.91	39	16.24	162	21.47
New Jersey	50	39.49	5	13.62	55	33.68
New York	64	33.28	6	7.62	70	25.83
Oregon	1	1.68	4	8.75	5	4.75
South Dakota	23	14.02	2	6.21	25	12.74
Washington	0	0	3	6.68	3	2.30
Wisconsin	68	24.53	14	13.18	82	21.39
Class B.						
Alabama	263	94.95	24	11.67	287	59.46
Alaska[b]	20	12.80	5	14.20	25	13.06
Arkansas	1	2.64	2	80.00	3	7.43
Connecticut	0	0.00	0	0.00	0	0.00
Florida	1	4.17	38	9.00	39	8.74
Georgia	0	0.00	0	0.00	0	0.00
Illinois	9	27.61	6	52.63	15	34.09
Indiana, Louisiana, and West Virginia	0	0.00	29	49.07	29	49.07
Iowa	0	0.00	0	0.00	0	0.00
Kansas	2	3.26	1	4.59	3	3.61
Kentucky	0	0.00	0	0.00	0	0.00
Maine	0	0.00	0	0.00	0	0.00
Maryland	0	0.00	0	0.00	0	0.00
Massachusetts	0	0.00	0	0.00	0	0.00
New Hampshire	0	0.00	0	0.00	0	0.00
New Mexico	7	5.43	6	4.95	13	5.20
North Carolina	7	9.60	6	17.70	13	12.17
Ohio	5	19.08	0	0.00	5	16.13
Oklahoma	1	3.17	1	4.42	2	3.70
Pennsylvania	0	0.00	6	9.12	6	7.87
South Carolina	0	0.00	10	10.00	10	9.61
Tennessee	38	33.45	37	15.78	75	21.55
Texas	0	0.00	0	0.00	0	0.00
Utah	153	26.40	84	31.56	237	28.02
Vermont	3	33.33	3	32.97	6	33.15
Virginia	15	14.05	6	4.14	21	8.35
Wyoming	1	3.73	0	0.00	1	1.51
Total, 1912	3,447	31.32	1,055	17.84	4,502	26.61
Total, 1911	3,263	31.19	906	14.77	4,169	25.12

[a] Includes those injured in shaft accidents.
[b] Does not include placer mines.

all ***metal*** *and* ***miscellaneous mineral*** *mines (except coal mines) in the United the calendar year* ***1912.***

Number slightly injured.						Character of accidents that must be reported according to State law.
Underground. (*a*)	Per 1,000 employed.	On the surface.	Per 1,000 employed.	**Total.**	**Per 1,000 employed.**	
3,398	293.56	272	67.73	**3,670**	**235.29**	All fatal and serious. Laws of 1912, sec. 16.
581	94.21	117	28.23	**698**	**67.69**	"More than one week." Laws of 1911, sec. 8.
598	88.23	90	42.57	**688**	**77.37**	"Fatal and two consecutive days." Rev. Stats., 1908 sec. 4303.
618	139.50	41	22.79	**659**	**105.80**	All fatal and serious. Rev. Code, 1908, sec. 207.
6,287	293.41	564	70.13	**6,851**	**232.48**	All injuries, fatal or otherwise. Laws of 1912, sec. 17.
2,150	252.11	1,417	176.44	**3,567**	**215.41**	"Any and all accidents." Laws of 1909, sec. 1.
1,422	166.69	164	57.10	**1,586**	**139.09**	All loss of life or serious injury. Rev. Stat., 1899, sec. 8815.
1,830	175.91	168	57.20	**1,998**	**149.78**	All fatal or serious in mines employing five or more men. Rev. Code, 1907, sec. 1719.
511	99.32	151	62.86	**662**	**87.72**	All "fatal and serious." Laws of 1912, sec. 4207-10.
499	39.41	21	57.22	**520**	**318.43**	Two weeks. Laws of 1912, chap. 156.
320	166.41	10	12.71	**330**	**121.77**	All "injuries causing incapacity." Laws of 1910, sec. 126.
19	31.93	6	12.25	**25**	**23.76**	All preventing duty and requiring physician. Laws of 1911, chap. 102, sec. 1.
149	90.80	2	6.21	**151**	**76.92**	All serious or fatal. Rev. Code, 1903, sec. 143.
17	19.81	3	6.68	**20**	**15.30**	"Any accident." Laws of 1911, sec. 14.
413	14.90	124	116.76	**537**	**140.06**	All "causing death or disability." Laws of 1911, sec. 2394, par. 35.
1,536	554.51	225	109.38	**1,761**	**364.82**	
42	26.89	22	62.50	**64**	**33.44**	Fatal or serious, at mines employing 6 or more men. Act of April 30, 1913, effective April 1, 1914.
5	13.19	5	200.00	**10**	**24.75**	
0	0.00	0	0.00	**0**	**0.00**	
0	0.00	192	45.49	**192**	**43.04**	
14	60.61	15	52.82	**29**	**56.31**	
21	64.42	3	26.32	**24**	**54.55**	Fatal or 30 days. Acts of 1907, sec. 1, p. 308.
0	0.00	219	370.56	**219**	**370.56**	
17	92.39	0	0.00	**17**	**85.00**	
23	37.52	4	18.35	**27**	**32.49**	
5	47.17	4	11.30	**9**	**19.57**	
0	0.00	0	0.00	**0**	**0.00**	
0	0.00	1	3.75	**1**	**3.04**	
1	21.74	0	0.00	**1**	**17.24**	
4	235.29	1	13.70	**5**	**55.56**	
20	15.52	134	110.47	**154**	**61.55**	
32	43.90	18	53.10	**50**	**46.82**	
20	76.34	0	0.00	**20**	**64.52**	
45	142.86	3	13.27	**48**	**88.72**	
0	0.00	2	3.04	**2**	**2.62**	Fatal or 2 days. Act of July 19, 1913.
0	0.00	26	25.97	**26**	**24.98**	
158	139.08	157	66.98	**315**	**90.52**	
2	8.85	1	6.25	**3**	**7.77**	
609	105.07	575	216.00	**1,184**	**139.99**	
0	0.00	6	65.93	**6**	**33.15**	
44	41.20	56	38.67	**100**	**39.75**	
3	11.19	0	0.00	**3**	**4.53**	
21,413	194.56	4,819	81.48	**26,232**	**155.04**	
18,115	173.15	4,293	69.97	**22,408**	**135.01**	

TABLE 20.—*Comparison, by years, of the number of men employed in the metal mines of the principal countries, showing the fatality rate per 1,000 persons employed.*[a]

Country.	1907			1908			1909			1910			1911			1912			1913		
	Number employed.	Number killed.	Number killed per 1,000 employed.	Number employed.	Number killed.	Number killed per 1,000 employed.	Number employed.	Number killed.	Number killed per 1,000 employed.	Number employed.	Number killed.	Number killed per 1,000 employed.	Number employed.	Number killed.	Number killed per 1,000 employed.	Number employed.	Number killed.	Number killed per 1,000 employed.	Number employed.	Number killed.	Number killed per 1,000 employed.
Australasia:																					
New South Wales	26,402	24	0.91	20,881	32	1.53	17,836	20	1.12	19,369	29	1.50	19,360	35	1.81	19,807	31	1.57	19,914	30	1.51
New Zealand	9,389	7	40.75	8,880	15	1.69	7,651	14	1.83	8,121	15	1.85	7,400	5	.68	......	......	......	......	......	......
Queensland	15,416	13	.84	13,759	29	2.11	12,050	26	2.16	12,342	18	1.46	11,091	10	.90	10,608	26	2.45	9,978	11	1.10
Tasmania[b]	7,516	6	.80	6,464	6	.93	6,054	6	.99	5,770	8	1.39	5,247	4	.76	5,566	53	9.52	......	......	......
Victoria	23,291	27	1.16	20,853	19	.91	18,671	15	.80	16,553	12	.72	14,051	19	1.35	11,856	16	1.35	11,931	9	.75
Western Australia	16,058	42	2.62	16,075	40	2.49	17,027	33	1.94	16,279	27	1.66	15,428	36	2.33	13,700	34	2.48	13,445	24	1.79
Austria	20,411	21	1.03	20,235	10	.49	19,582	19	.97	19,621	16	.82	19,934	10	.50	20,890	20	1.00	......	......	......
France	24,197	55	2.27	24,179	51	2.11	24,436	73	2.99	27,183	86	3.16	29,998	85	2.84	31,602	104	3.29	......	......	......
Germany	98,441	155	1.57	97,062	115	1.18	93,928	91	.97	93,645	141	1.51	92,964	148	1.59	93,591	173	1.85	......	......	......
Great Britain[c]	31,602	34	1.08	29,927	37	1.24	28,437	40	1.41	28,676	43	1.50	29,025	43	1.48	28,058	43	1.53	27,412	32	1.16
Greece	11,720	23	1.96	......	......	......	8,389	13	1.55	6,933	9	1.30	......	......	......	......	......	......	......	......	......
Italy	59,597	113	1.90	......	......	......	52,648	69	1.31	49,995	59	1.18	......	......	......	......	......	......	......	......	......
Japan	85,663	113	1.32	75,590	70	.93	81,312	138	1.70	84,728	118	1.39	80,896	142	1.76	......	......	......	......	......	......
Mexico[d]	92,421	479	5.18	85,107	395	4.64	81,438	471	5.78	......	......	......	......	......	......	......	......	......	......	......	......
Peru[d]	16,936	......	......	17,349	40	2.31	17,580	21	1.19	20,410	118	5.78	......	......	......	......	......	......	......	......	......
Portugal	3,928	10	2.55	6,991	9	1.29	7,858	11	1.40	6,554	11	1.68	7,484	10	1.34	......	......	......	......	......	......
Russia	191,916	155	.80	191,334	178	.93	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Spain[e]	155,792	304	1.95	147,581	275	1.86	150,681	282	1.87	155,182	256	1.65	143,863	180	1.25	149,884	260	1.73	......	......	......
Sweden[f]	14,204	......	......	14,628	16	1.09	13,238	16	1.21	13,775	......	......	......	......	......	......	......	......	......	......	......
Transvaal	168,991	805	4.76	181,637	761	4.19	192,038	1,018	5.30	205,687	882	4.29	225,538	934	4.14	240,000	900	3.75	223,380	851	3.81
United States	......	......	......	......	......	......	......	......	......	......	......	......	165,979	695	4.19	169,199	661	3.91	193,088	683	3.54

[a] Compiled from official reports.
[b] Figures for mines in Tasmania also cover coal mines and smelting works. The high rate for 1912 is due to one disastrous mine fire.
[c] Figures cover only mines coming under the "Metalliferous Mines Regulation Act."
[d] Figures also cover coal mines.
[e] Figures also cover coal mines in which about 25,000 men are employed, and metallurgical works employing about 25,000 men annually.
[f] Figures also cover coal mines and quarries.

PUBLICATIONS ON MINE ACCIDENTS AND METHODS OF MINING.

Limited editions of the following Bureau of Mines publications are temporarily available for free distribution. Requests for all publications can not be granted, and applicants should select only those publications that are of especial interest to them. All requests for publications should be addressed to the Director, Bureau of Mines, Washington, D. C.:

BULLETIN 10. The use of permissible explosives, by J. J. Rutledge and Clarence Hall. 1912. 34 pp., 5 pls., 4 figs.

BULLETIN 17. A primer on explosives for coal miners, by C. E. Munroe and Clarence Hall. 61 pp., 10 pls., 12 figs. Reprint of United States Geological Survey Bulletin 423.

BULLETIN 20. The explosibility of coal dust, by G. S. Rice, with chapters by J. C. W. Frazer, Axel Larsen, Frank Haas, and Carl Scholz. 204 pp., 14 pls., 28 figs.

BULLETIN 42. The sampling and examination of mine gases and natural gas, by G. A. Burrell and F. M. Seibert. 1913. 116 pp., 2 pls., 23 figs.

BULLETIN 45. Sand available for filling mine workings in the Northern Anthracite Coal Basin of Pennsylvania, by N. H. Darton. 1913. 33 pp., 8 pls., 5 figs.

BULLETIN 46. An investigation of explosion-proof mine motors, by H. H. Clark. 1912. 44 pp., 6 pls., 14 figs.

BULLETIN 48. The selection of explosives used in engineering and mining operations, by Clarence Hall and S. P. Howell. 1913. 50 pp., 3 pls., 7 figs.

BULLETIN 50. A laboratory study of the inflammability of coal dust, by J. C. W. Frazer, E. J. Hoffman, and L. A. Scholl, jr. 1913. 60 pp., 95 figs.

BULLETIN 52. Ignition of mine gases by the filaments of incandescent electric lamps, by H. H. Clark and L. C. Ilsley. 1913. 31 pp., 6 pls., 2 figs.

BULLETIN 53. Mining and treatment of feldspar and kaolin in the southern Appalachian region, by A. S. Watts. 1913. 170 pp., 16 pls., 12 figs.

BULLETIN 56. First series ot coal-dust explosion tests in the experimental mine, by G. S. Rice, L. M. Jones, J. K. Clement, and W. L. Egy. 1913. 115 pp., 12 pls., 28 figs.

BULLETIN 60. Hydraulic mine filling; its use in the Pennsylvania anthracite fields; a preliminary report, by Charles Enzian. 1913. 77 pp., 3 pls., 12 figs.

BULLETIN 68. Electric switches for use in gaseous mines, by H. H. Clark and R. W. Crocker. 1913. 40 pp., 6 pls.

BULLETIN 69. Coal-mine accidents in the United States and foreign countries, compiled by F. W. Horton. 1913. 102 pp., 3 pls., 40 figs.

BULLETIN 83. The humidity of mine air, with especial reference to coal mines in Illinois, by R. Y. Williams. 1914. 69 pp., 7 figs.

TECHNICAL PAPER 4. The electrical section of the Bureau of Mines, its purpose and equipment, by H. H. Clark. 1911. 12 pp.

TECHNICAL PAPER 6. The rate of burning of fuse as influenced by temperature and pressure, by W. O. Snelling and W. C. Cope. 1912. 28 pp.

TECHNICAL PAPER 7. Investigations of fuse and miners' squibs, by Clarence Hall and S. P. Howell. 1912. 19 pp.

TECHNICAL PAPER 11. The use of mice and birds for detecting carbon monoxide after mine fires and explosions, by G. A. Burrell. 1912. 15 pp.

TECHNICAL PAPER 13. Gas analysis as an aid in fighting mine fires, by G. A. Burrell and F. M. Seibert. 1912. 16 pp., 1 fig.

TECHNICAL PAPER 14. Apparatus for gas-analysis laboratories at coal mines, by G. A. Burrell and F. M. Siebert. 1913. 24 pp., 7 figs.

TECHNICAL PAPER 17. The effect of stemming on the efficiency of explosives, by W. O. Snelling and Clarence Hall. 1912. 20 pp., 11 figs.

TECHNICAL PAPER 18. Magazines and thaw houses for explosives, by Clarence Hall and S. P. Howell. 1912. 34 pp., 1 pl., 5 figs.

TECHNICAL PAPER 19. The factor of safety in mine electrical installations, by H. H. Clark. 1912. 14 pp.

TECHNICAL PAPER 21. The prevention of mine explosions, report and recommendations, by Victor Watteyne, Carl Meissner, and Arthur Desborough. 12 pp. Reprint of United States Geological Survey Bulletin 369.

TECHNICAL PAPER 22. Electrical symbols for mine maps, by H. H. Clark. 1912. 11 pp., 8 figs.

TECHNICAL PAPER 24. Mine fires, a preliminary study, by G. S. Rice. 1912. 51 pp., 1 fig.

TECHNICAL PAPER 28. Ignition of mine gas by standard incandescent lamps, by H. H. Clark. 1912. 6 pp.

TECHNICAL PAPER 29. Training with mine-rescue breathing apparatus, by J. W. Paul. 1912. 16 pp.

TECHNICAL PAPER 30. Mine-accident prevention at Lake Superior iron mines, by D. E. Woodbridge. 1913. 38 pp., 9 figs.

TECHNICAL PAPER 39. The inflammable gases in mine air, by G. A. Burrell and F. M. Seibert. 1913. 24 pp., 2 figs.

TECHNICAL PAPER 40. Metal-mine accidents in the United States during the calendar year 1911, compiled by A. H. Fay. 1913. 54 pp.

TECHNICAL PAPER 43. The effect of inert gases on inflammable gaseous mixtures, by J. K. Clement. 1913. 24 pp., 1 pl., 8 figs.

TECHNICAL PAPER 44. Safety electric switches for mines, by H. H. Clark. 1913. 8 pp.

TECHNICAL PAPER 46. Quarry accidents in the United States during the calendar year 1911, compiled by A. H. Fay. 1913. 32 pp.

TECHNICAL PAPER 47. Portable electric mine lamps, by H. H. Clark. 1913. 13 pp.

TECHNICAL PAPER 48. Coal-mine accidents in the United States, 1896–1912, with monthly statistics for 1912, compiled by F. W. Horton. 1913. 74 pp., 10 figs.

TECHNICAL PAPER 52. Permissible explosives tested prior to March 1, 1913, by Clarence Hall. 1913. 11 pp.

TECHNICAL PAPER 58. The action of acid mine water on the insulation of electrical conductors; a preliminary report, by H. H. Clark and L. C. Ilsley. 1913. 26 pp., 1 fig.

TECHNICAL PAPER 59. Fires in Lake Superior Iron mines, by Edwin Higgins. 1913. 34 pp., 2 pls.

TECHNICAL PAPER 61. Metal-mine accidents in the United States during the calendar year 1912, compiled by A. H. Fay. 1913. 76 pp., 1 fig.

TECHNICAL PAPER 77. Report of the committee on resuscitation from mine gases, by W. B. Cannon, G. W. Crile, Joseph Erlanger, Yandell Henderson, and S. T. Meltzer. 1914. 36 pp., 4 figs.

TECHNICAL PAPER 92. Quarry accidents in the United States during the calendar year 1913, compiled by A. H. Fay. 1914. 66 pp.

MINERS' CIRCULAR 5. Electrical accidents in mines, their causes, and prevention, by H. H. Clark, W. D. Roberts, L. C. Ilsley, and H. F. Randolph. 1911. 10 pp., 3 pls.

MINERS' CIRCULAR 7. The use and misuse of explosives in coal mining, by J. J. Rutledge. 1914. 52 pp., 8 figs.

MINERS' CIRCULAR 8. First-aid instructions for miners, by M. W. Glasgow, W. A. Raudenbush, and C. O. Roberts. 1913. 66 pp., 46 figs.

MINERS' CIRCULAR 12. Use and care of miners' safety lamps, by J. W. Paul. 1913. 16 pp., 4 figs.

MINERS' CIRCULAR 13. Safety in tunneling, by D. W. Brunton and J. A. Davis. 1913. 19 pp.

MINERS' CIRCULAR 14. Gases found in coal mines, by G. A. Burrell and F. M. Seibert. 1914. 23 pp.

MINERS' CIRCULAR 15. Rules for mine-rescue and first-aid field contests, by J. W. Paul. 1913. 12 pp.

MINERS' CIRCULAR 16. Hints on coal-mine ventilation, by J. J. Rutledge. 1914. 22 pp.

MINERS' CIRCULAR 17. Accidents from falls of rock or ore, by Edwin Higgins. 1914. 15 pp., 8 figs.

MINERS' CIRCULAR 19. The prevention of accidents from explosives in metal mining, by Edwin Higgins. 1914. 16 pp., 11 figs.

○